

# -Series Intelligent Access Control Systems

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## **IQ Series Installation Manual**

**33-10036-001**

**REV: G**

**PCSC**

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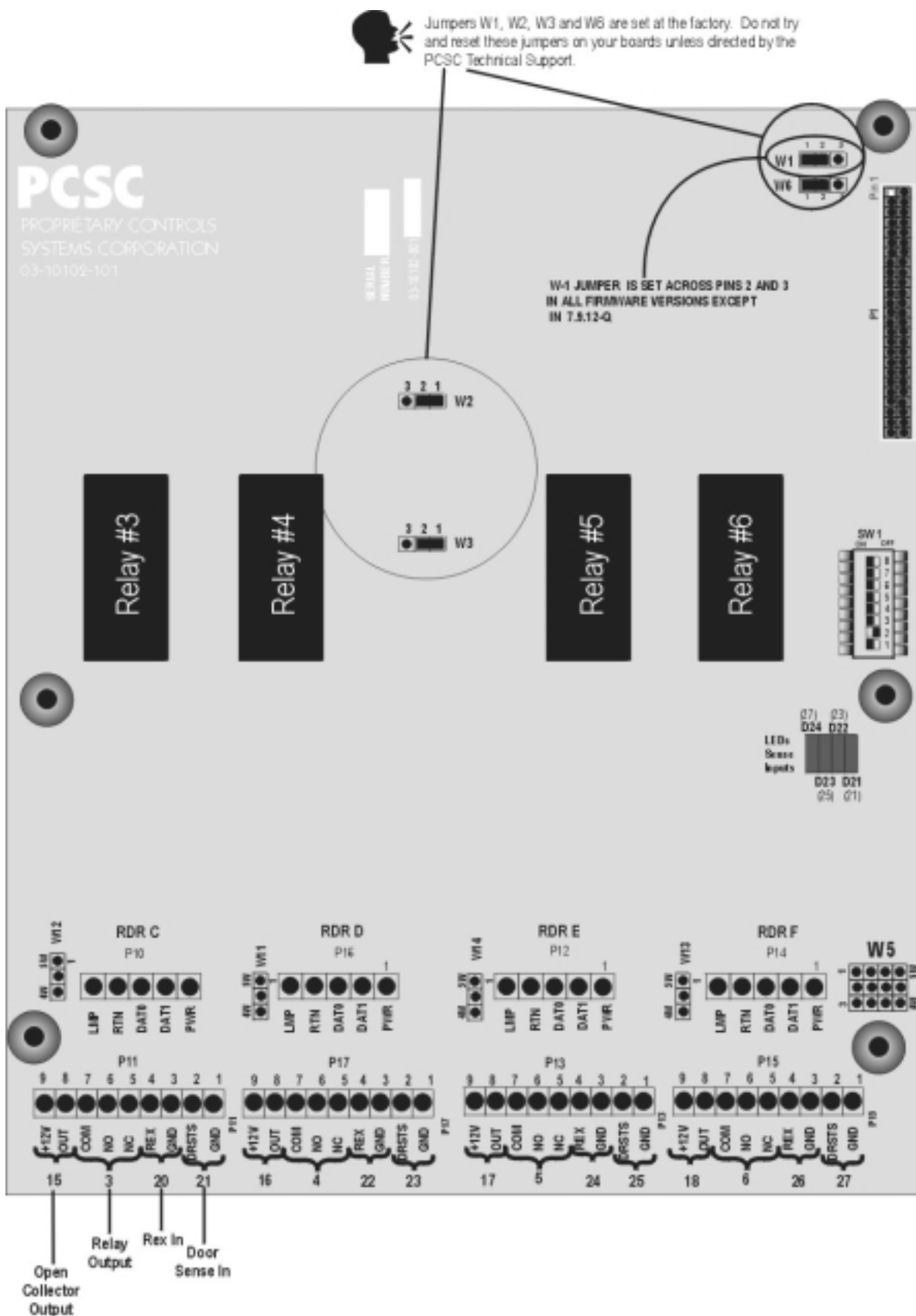
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## **Changes and additions in Revision G:**

1. Address changed on page i
2. Logo changed on page i-ii





**4-Door Expansion Board**



Jumpers W1, W2, W3 and W6 are set at the factory. Do not try and reset these jumpers on your boards unless directed by PCSC Technical Support.

**PCSC**

PROPRIETARY CONTROLS  
SYSTEMS CORPORATION  
03-10102-001

SERIAL  
NUMBER  
03-10102-001

3 2 1  
W2

3 2 1  
W3

W1  
W6

W-1 JUMPER IS SET ACROSS PINS 2 AND 3  
IN ALL FIRMWARE VERSIONS EXCEPT  
IN 7.9.12-Q

Pin 1  
P1

Relay #3

Relay #7

Relay #4

Relay #8

Relay #5

Relay #9

Relay #6

Relay #10

SW 1  
ON OFF  
8  
7  
6  
5  
4  
3  
2  
1

LEDs  
Sense  
Inputs

(35) D24 (31) D22 (27) D20 (23) D18  
D23 (33) D21 (29) D19 (25) D17 (21)

RDR C  
P2  
1  
LMP RTN DAT0 DAT1 PVR

RDR D  
P8  
1  
LMP RTN DAT0 DAT1 PVR

RDR E  
P4  
1  
LMP RTN DAT0 DAT1 PVR

RDR F  
P6  
1  
LMP RTN DAT0 DAT1 PVR

W4

P3  
9 8 7 6 5 4 3 2 1  
#12V OUT COM NO NC REX GND DRSTS  
15 3 20 21

P9  
9 8 7 6 5 4 3 2 1  
#12V OUT COM NO NC REX GND DRSTS  
16 4 22 23

P5  
9 8 7 6 5 4 3 2 1  
#12V OUT COM NO NC REX GND DRSTS  
17 5 24 25

P7  
9 8 7 6 5 4 3 2 1  
#12V OUT COM NO NC REX GND DRSTS  
18 6 26 27

RDR G  
P10  
1  
LMP RTN DAT0 DAT1 PVR

RDR H  
P16  
1  
LMP RTN DAT0 DAT1 PVR

RDR I  
P12  
1  
LMP RTN DAT0 DAT1 PVR

RDR J  
P14  
1  
LMP RTN DAT0 DAT1 PVR

W5

P11  
9 8 7 6 5 4 3 2 1  
#12V OUT COM NO NC REX GND DRSTS  
19 7 28 29

P17  
9 8 7 6 5 4 3 2 1  
#12V OUT COM NO NC REX GND DRSTS  
20 8 30 31

P13  
9 8 7 6 5 4 3 2 1  
#12V OUT COM NO NC REX GND DRSTS  
21 9 32 33

P15  
9 8 7 6 5 4 3 2 1  
#12V OUT COM NO NC REX GND DRSTS  
22 10 34 35

Open  
Collector  
Output  
Relay  
Output  
Rex In  
Door  
Sense In

## 8-Door Expansion Board

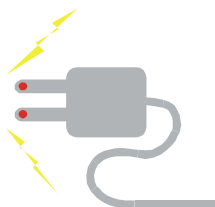
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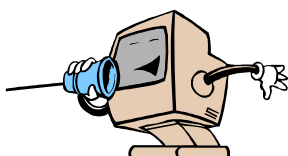
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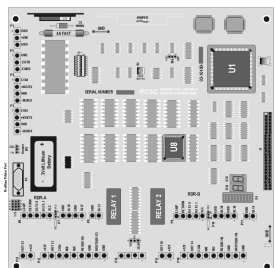
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# Introduction

**Welcome to the IQ-200, the newest generation of intelligent access control system from PCSC.**

Setting up the IQ-200 is easy. This manual explains IQ-200 installation and connection to a Personal Computer (PC) and an optional local printer. We've recently redesigned the format of this manual to make it easier for you to read and understand. The IQ Manual is now divided up into six steps:

**Step 1- Unpacking the IQ-200**

**Step 2- Installing Power**

**Step 3- Wiring Your Readers**

**Step 4- Wiring Your Door(s)**

**Step 5- Communicating with the IQ-200**

**Step 6- Status Lights and Dealing with Communication Errors**

Before turning on the IQ-200 or the PC, take a moment to read through this manual. It has been designed to allow you to move through the installation process quickly and with a minimum of frustration. Specifics about the IQ-200 and its component systems can be found in:

**Appendix: IQ-200 Specifications**

**NOTE** The IQ-200 system is set up at the factory. Do NOT re-initialize the system unless other modules have been added.

The LiNC-NET Network Controller communicates on a multi-point RS485 communication cable (RS-232 and MODEM communication are also available). You must address each IQ-200 with a unique ID number (1-111) in order to communicate to each IQ-200 panel. Numbering the IQ-200s should be in ascending order, but it is not required for operation.



Installation must meet all local, state, and federal regulations and codes for electrical installation. If these codes conflict with the installation methods described in this manual, please call your service representative.



## **UL Listing**

The IQ-200 control unit is UL listed to the standard for Access Control System Units, UL 294. The following card readers have been found compatible by UL with the IQ-200:

PCSC, Models BR-370 and BR-470

HID, Models MiniProx

## What's New About the IQ-200!!!



- A Supervised *Tamper* Sense Input (**SI #13**)
- Two Supervised *Egress* Input's (**SI #16 & #18**)
- Five Supervised *User Defined Alarm Points* (**SI #14, #36, #37, #38, #39**)
- Two additional *General Purpose Powered Outputs* (**CC #23 & #24**)
- Two 7 Segment LED's for Simplified Error Code Identification
- A 10 Segment LED Array for Simplified Annunciation of **ALL** Sense Inputs
- Support of either **4** or **5** Wire Card Readers (*PCSC* or *Wiegand* Type) at **BOTH** Ports

## **Step 1-Unpacking the IQ-200**



## Step 1

### Unpacking the IQ-200



As you unpack the IQ-200, inspect it for missing items or damage. Contact the dealer for any irregularities. Keep ALL packing material for protection in return shipping.

### Tool Requirements-

**Cable Connection tool** Inserting the cable to the AMP connectors from the PCSC readers must be performed with either an AMP Insertion Handle (P/N 88-08003) w/ an AMP Head (P/N 88-08005) or an AMP hand tool (P/N 88-08006) for MTA connectors. Any other tool may cause improper connection or damage to the system. On the IQ-200 circuit board, a standard screwdriver is required for securing cabling connections.

**Reader Locking tool** As a security measure, some readers are equipped with a security bolt. This bolt requires a special driver (P/N 88-08002) to secure each reader and PIN pad.

### Visual Inspection

1. Are all of the socketed Integrated Circuit chips seated in their sockets? Socket IC's U1 & U8 are located in the upper right side of the board in close vicinity to the Header connector J1, and just above the door relay K2 respectively.
2. Are the Door Relay's seated and latched into their sockets? The Door Relay's K1 & K2 are locked at the bottom center of the board.
3. Is the Lithium Battery seated in its socket? The Lithium Battery is located in socket BT1 located in the middle left side of the board next to DB9 Connector P5.
4. Are all of the plugs on connectors affixed to their male header connectors? Plugs on connectors are located along the left-hand edge of the board at Plug P1-P2-P4-P3-P6-P7-P8-P9-P10-P11. Plugs on connectors are located along the bottom portion of the board at plug P12-P13-P14-P15-P16.
5. Is the Fuse in place at socket F1 located in the upper left corner of the board? A 4 Amp fast blow (3AG) fuse is required.

#### W1- Reader Format (Both Readers)

- Across Pins #1 and #2= 5 Volt Card Reader
- Across Pins #2 and #3=12 Volt Card Reader
- Across Pins #4 and #5, #7 and #8, #10 and #11= 5-wire Wiegand Data (Data0, Data1) Format
- Across Pins #5 and #6, #8 and #9, #11 and #12= 4-wire PCSC Data Format



#### W5- End of Line RS-485 Termination Resistor

- Across pins #1 and #2= No Termination (when IQ-200 is not the last panel on the RS-485 channel, or when using RS232/modem connections)
- Across pins #2 and #3= 120  $\Omega$  End of Line termination (when IQ-200 is the last panel on the RS-485 channel).



#### W3- Reader A Data Format

(Must be set consistently with Data format set on W1 and W2)

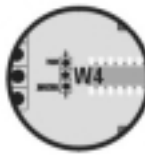
- Across Pins #1 and #2= 5-wire Wiegand Data (Data0, Data1) format
- Across Pins #2 and #3= 4-wire PCSC Data format



#### W4- A/D Converter

PCSC Factory Set across

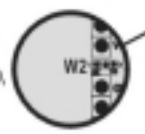
⚠ Do Not Alter Setting!



#### W2- Reader B Data Format

(Must be set consistently with Data format set on W1 and W3)

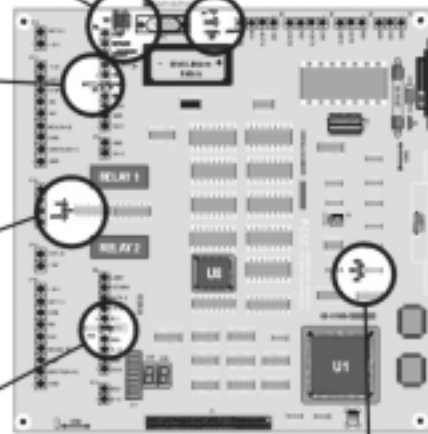
- Across Pins #1 and #2= 5-wire Wiegand Data (Data0, Data1) format
- Across Pins #2 and #3= 4-wire PCSC Data format



#### W6- Watch Dog Timer

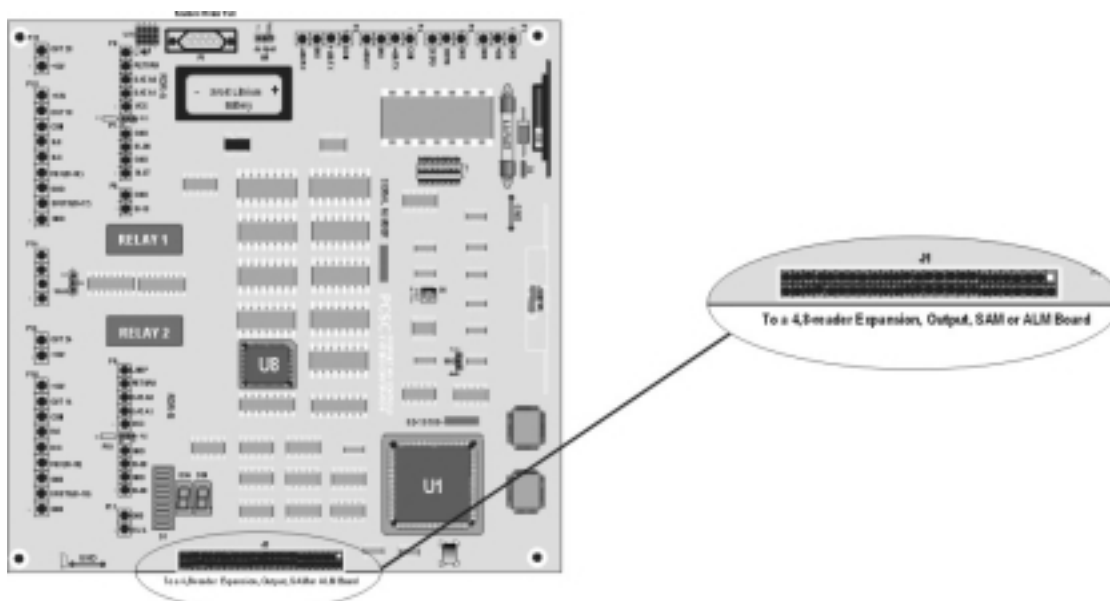
PCSC Factory Set

⚠ Do Not Alter Setting!



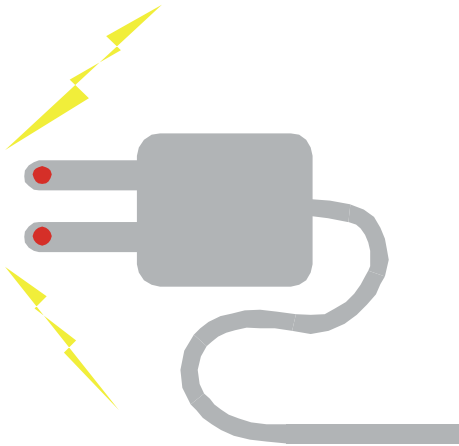
#### 6. Are the Jumpers in place at W1, W2, W3, W4 & W6?

- Jumper W1 is located in the LOWER LEFT side of the board and is set for 12 volt-4-wire, 12 volt-5-wire, or 5-volt-5-wire readers.
- Jumper W2 is located in the LOWER RIGHT side of the board between Plug P9 and P10 and is set for 4 or 5 wire readers.
- Jumper W3 is located in the LOWER LEFT side of the board between Plug P6 and P7 and is set for 4 or 5 wire readers.
- Jumper W4 is located in the BOTTOM CENTER side of the board and is factory set and should not be altered.
- Jumper W5 is located in the LEFT CENTER of the board next to DB9 connector P6 and is set for RS232 or RS485 communications.
- Jumper W6 is located in the upper right side of the board between U28 and U32. It is set across pins 2 and 3.

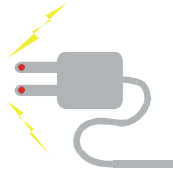


7. Is the 50 pin Expansion Buss Ribbon Cable connected to the IQ-200 at Plug J1. Note that the RED stripe on the edge of the ribbon cable should be connected to pin #1 of Plug P1.
8. Is the opposite end of the 50 pin Expansion Buss Ribbon Cable connected to a Peripheral Expansion Board at its Plug P1? The Possible expansion boards are the new 4-door expansion PCB, 8-door PCB, OUT PCB, ALM PCB, SAM PCB's.

## Step 2-Installing Power



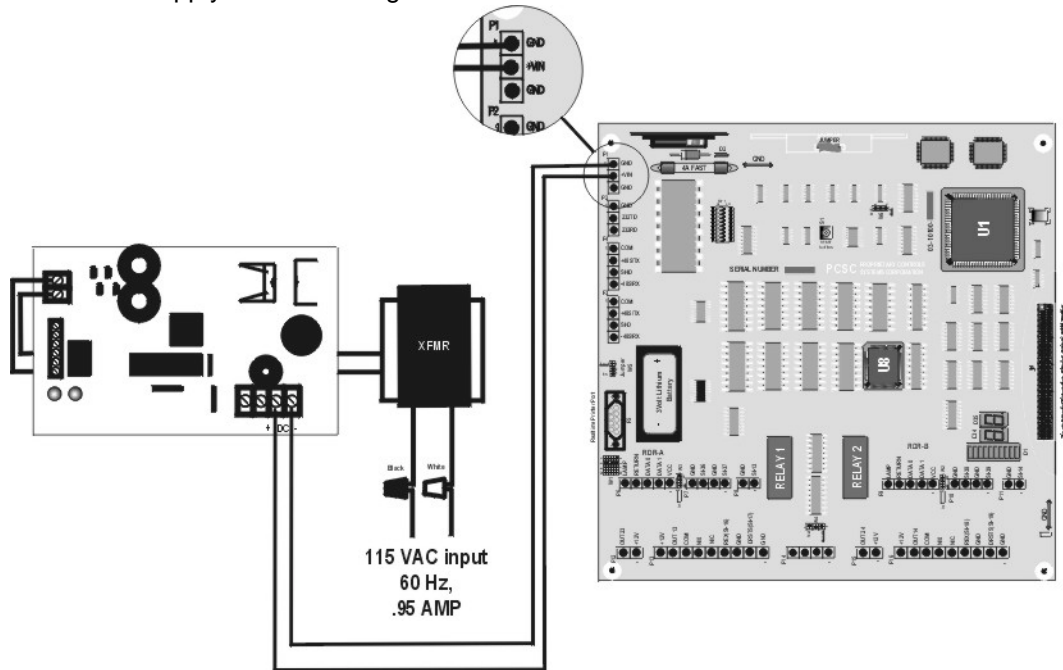
## Step 2- Installing Power



### Installing Power- 2.5 Amp\*

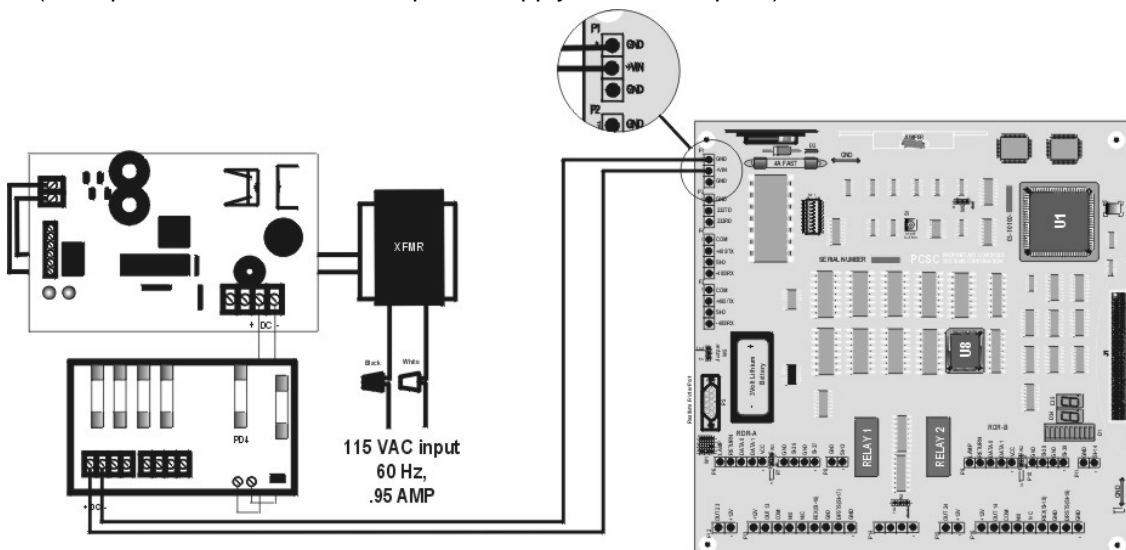
(example shows Altronix SMP3 power supply)

12VDC power is connected to the circuit board at P1 in the upper left corner. Disconnect power mains from the supply until the wiring is secured.



### Installing Power- 2.5 Amp w/PD4\*

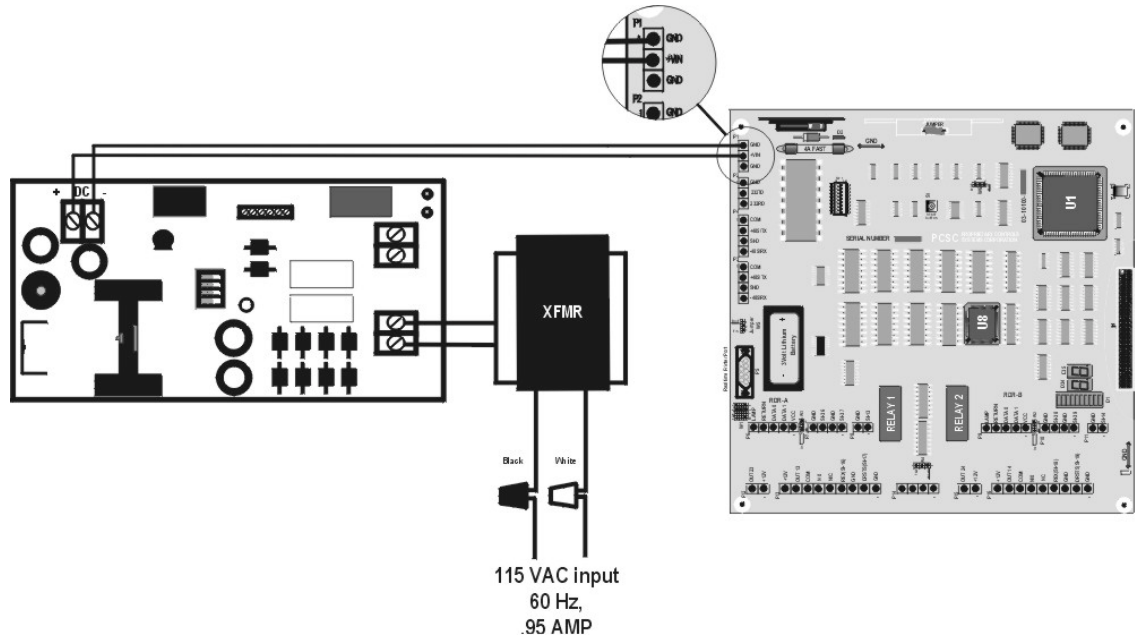
(example shows Altronix SMP3 power supply with PD-4 option)



\* State-optional 24VDC power option available. Contact PCSC sales representative.

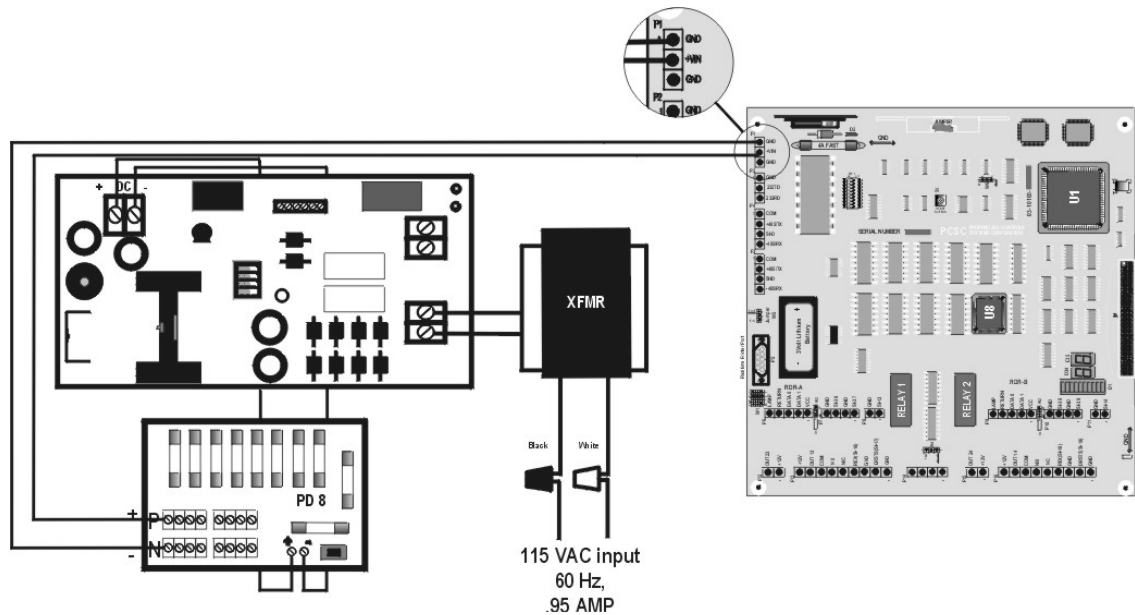
## Installing Power- 6 Amp\*

(example shows Altronix SMP7 power supply)



## Installing Power- 6 Amp w/ PD8\*

(example shows Altronix SMP7 power supply with PD-8 option)



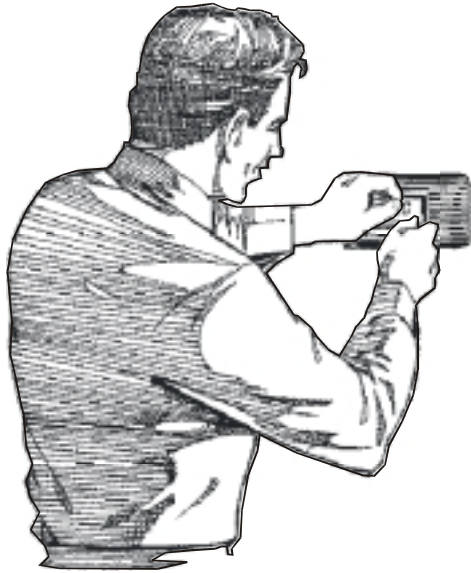
\* State-optional 24VDC power option available. Contact PCSC sales representative.

## Resetting the IQ-200 to Default Values

In the event that the 3-volt lithium battery is removed or loses its electrical charge, the IQ must be reset. Follow the procedures below to restore the controller to the default values.

1. With power on, move all switches at DIP switch **SW1** to the right OFF (as printed on the circuit board).
2. Press the Reset button at **S1**.
3. The 10 Segment LED array (D1) will flash in waterfall effect and then stop. The Seven Segment LEDs (D34 and D35) will show **8.8.** while the NMI process is underway. When the NMI process is complete, all 10 segments of the LED Array (D1) will turn OFF, and the seven segment LEDs will show a single line segment flashing in a circular pattern clockwise.
4. Refer to page 69 and begin addressing the IQ-200 by DIP switching the IQ number (1-111).
5. Set the communication protocol by following the instructions on page 73 [Setting MODEM or Direct Connect Configurations].
6. The system is now set to the default values. Refer to Quick Setup Steps for page references.

## Step 3-Wiring Your Readers



## **Grounding Your Readers**

PCSC has designed its products to withstand most inductive voltage spikes without affect. However, some noise found in power supplies and door strikes, in addition to static discharge, may cause the control unit to momentarily shut down, lockup, or, in extreme cases, become damaged. Unexplained lockups and intermittent system behavior are common symptoms of static or noise problems. If cycling power will remedy your problem, carefully follow these instructions:

1. Install MOVs (Metal Oxide Varistors, Siemens S10K30 or the equivalent) or reversed biased diodes (1N4004 - 1N4007) at each door strike. When installed, they will suppress most problem door strikes.
2. Readers should be properly earth grounded for uninterrupted reads. Please be aware that operation is affected by the amount of static present during certain times of the year.
3. Properly grounding all readers and hardware, in addition to suppressing noise in the peripheral equipment, should allow for many problem free years of use with PCSC products.
4. In addition, PCSC recommends using a separate filtered, electronically regulated output, switchable power supply for door strikes.
5. Before installing the reader, please read the following instructions. Damage may occur if this is disregarded.
6. Installation must meet all local, state, and federal regulations and codes for electrical installation. If these codes conflict with the installation methods described in this manual, please call your service representative.

## **Properly Routing Your Cables**

Do not route data and power cables in the same conduit. Crosstalk and transmission of electrical noise may result. The IQ-200 printed circuit boards will become damaged if the power cable grounds to the data cable.

## Grounding the Power and Data Lines

Each cable has a set of drain lines that can be attached on the Host or controller end of the cable to any screws mounted in the optional enclosures. If other non-metallic enclosures are used for controller housing, ensure that an alternative source for earth grounding is available.

### Procedure:

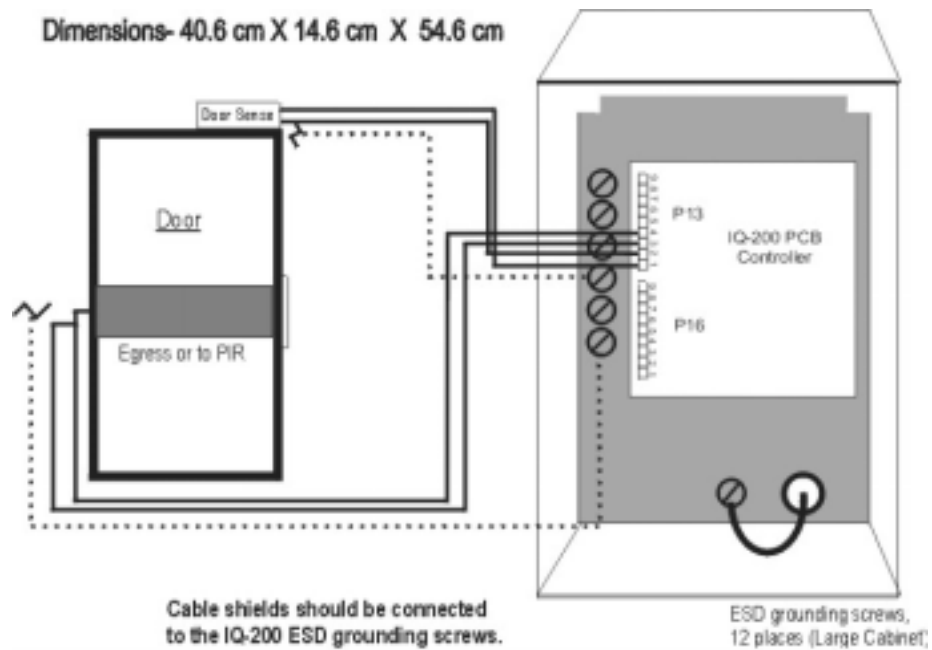
1. At the reader site, it is important to be aware of both the static generated from the user end as well as electrical grounding from the data and power cabling. If at all possible, the reader mounting plate should be attached to a grounded junction box or to another source, if the junction box is non-metallic. This alleviates the possible damage caused by static electricity.



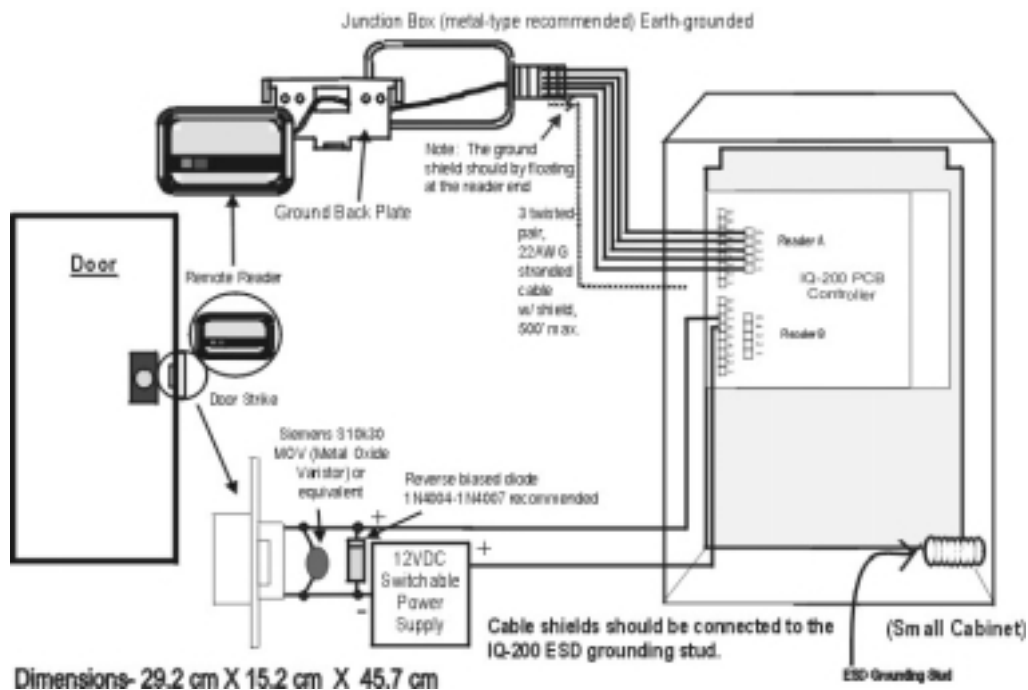
Do NOT leave the Drain Line taped back and floating at the reader site.

2. If grounding locally is not possible, connect drain wires to provided ESD (Electro Static Discharge) hardware at the controller site (enclosure) or to earth grounded conduit. As each reader port is progressively farther away from the ESD hardware location (left rear side of the cabinet for IQ-200s), allow for enough drain line to reach the ESD hardware on the controller end of the cable. Allow enough strain relief to avoid touching other circuitry or creating excessive tension.

## Diagram of IQ-200 to Door Sense and Egress/PIR (Grounding the cables)



## Diagram of IQ-200 to Door Strike and Reader (Grounding the cables)

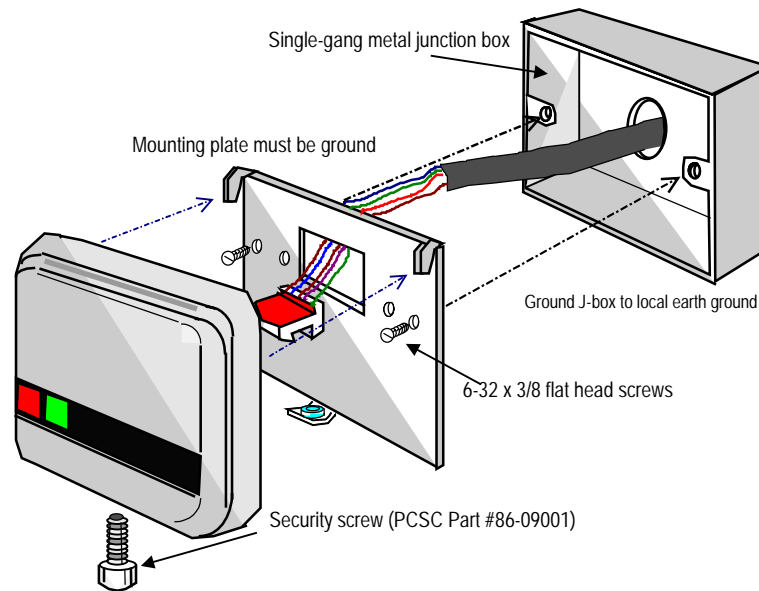


## Grounding the Pin Pad or Reader

The card-reader is comprised of a housing and a mounting plate. The mounting plate is typically attached to a single-gang, 2 x 4 inch earth-grounded junction box (preferably metal-type). The reader may be installed either vertically or horizontally, depending on the installation requirements.

### Procedure:

1. Orient the mounting plate so that the protruding ears on top and facing the back of the reader or PIN Pad. Attach the mounting plate to the junction box using 2 #6-32 x 3/8" flat head screws. The mounting plate should be earth ground either to a ground junction box or directly to an earth ground source (especially if the junction box is not metal).
2. Connect the cable to the rear of the reader at J1. Secure the shield drain lines to one of the grounding screws in the IQ-200 enclosure.
3. Place mounting holes on the back of the reader over the latches on the mounting plate and position the unit so that the cover is flush with the mounting plate.
4. Secure the unit to the mounting plate by inserting the special security fastener through the hole in the bottom of the reader. Tighten it using the security driver.

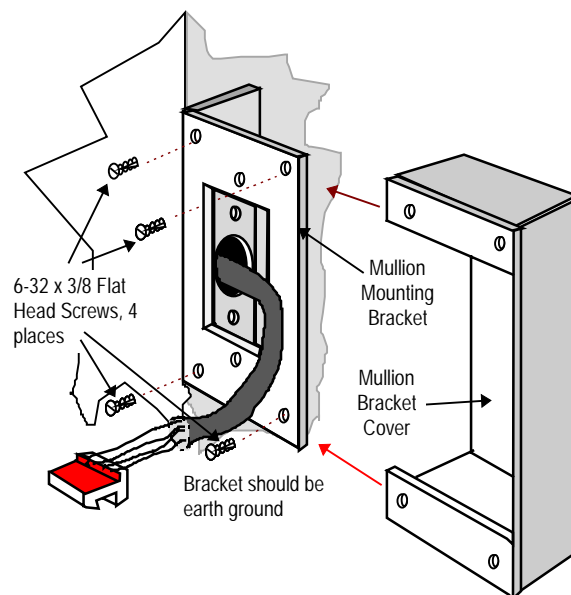


## Grounding the Reader Mullion Mount

The reader may be attached to a glass or door mullion separator (either vertically or horizontally) by using the mullion bracket adapter kits (04-10170-001 for horizontal mounting or 04-10171-001 for vertical mounting).

### Procedure:

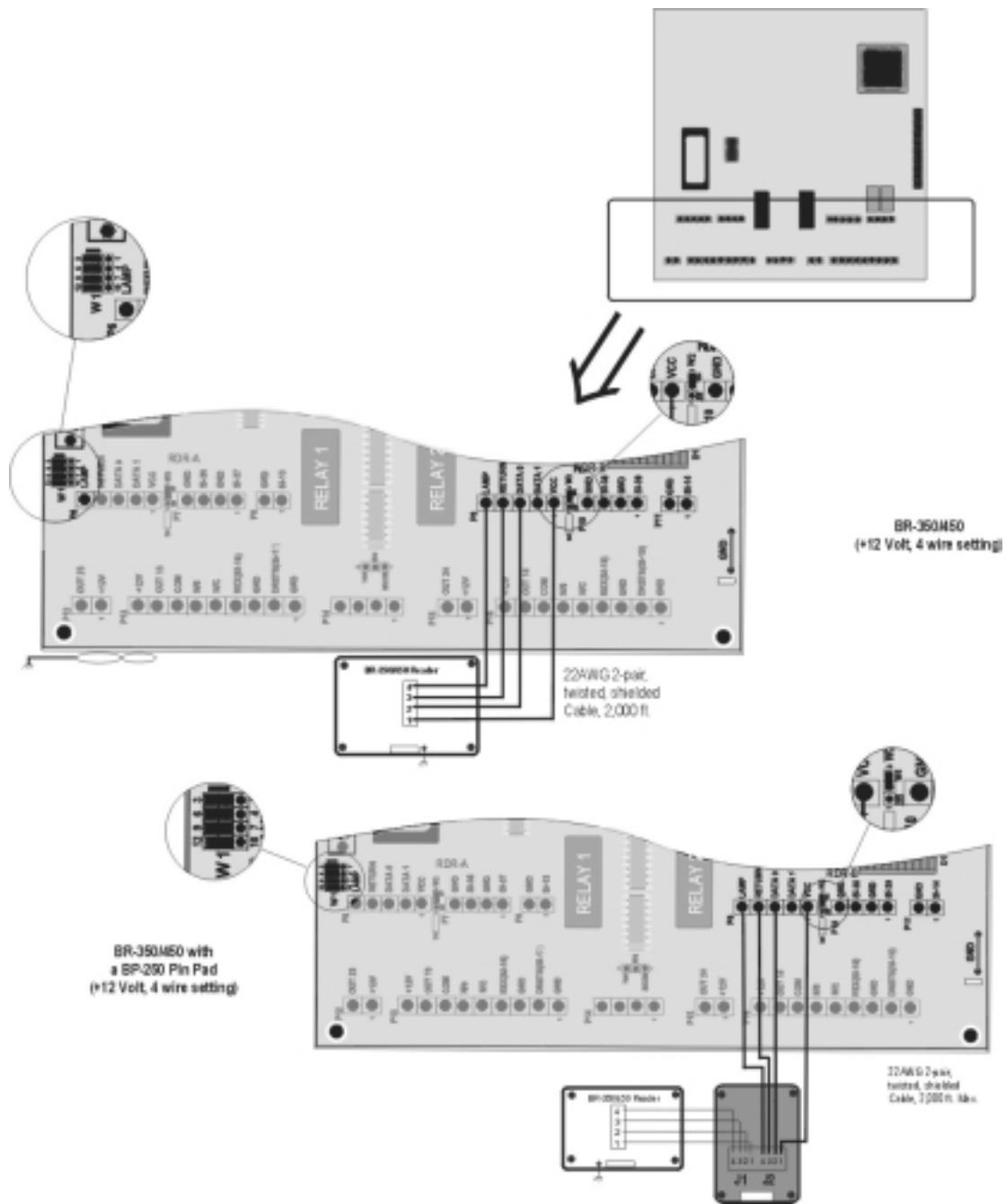
1. At the IQ end, secure the drain lines to one of the ESD grounding screws in the IQ-200 box. At the reader end, leave the drain line floating. It is recommended that the mullion adapter be affixed to an earth grounded or to the incoming conduit.
2. Mount the reader to the J-box or mullion bracket.



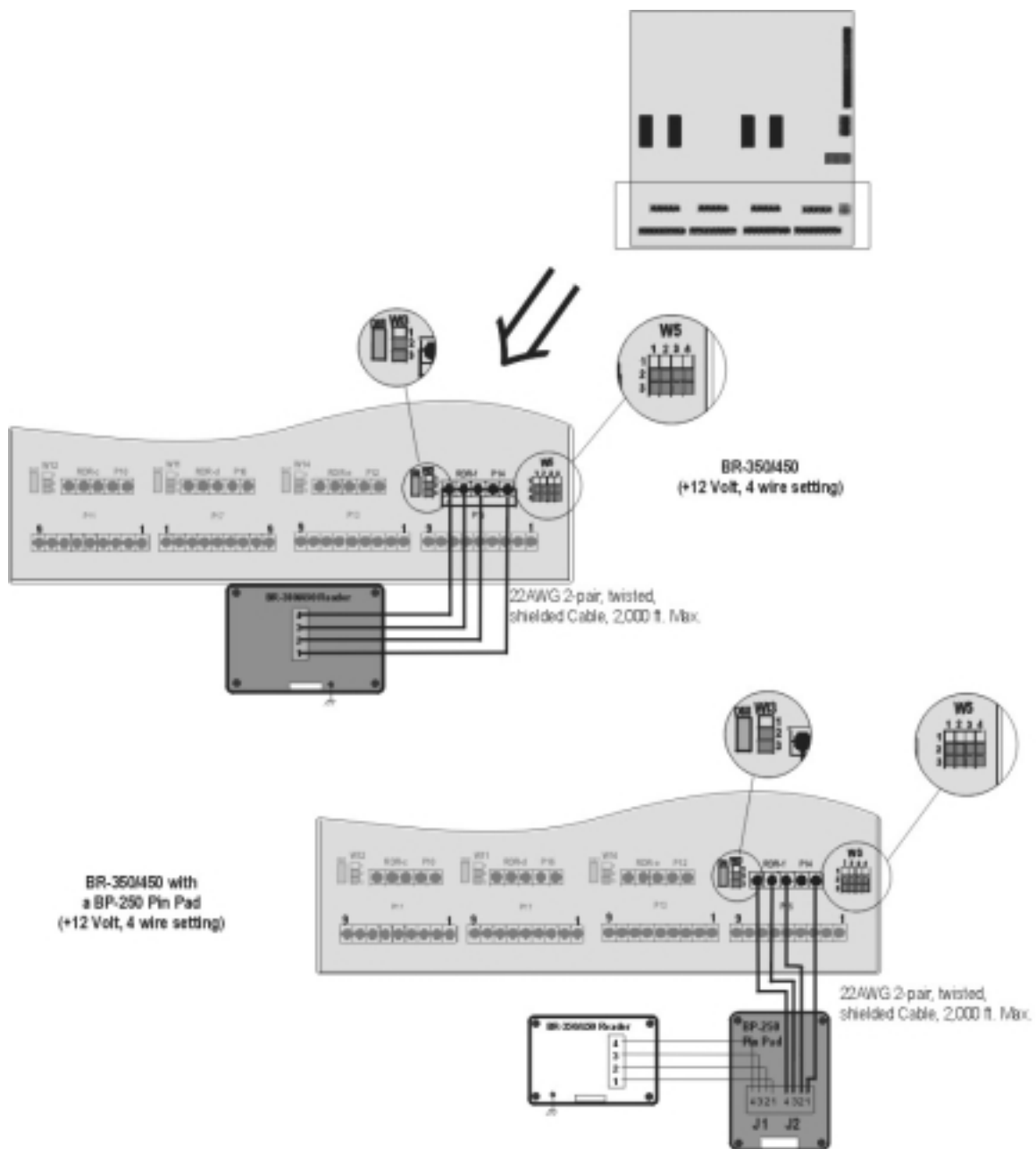
**Reader Mullion Mount Installation & Grounding**

## **Reader Connections**

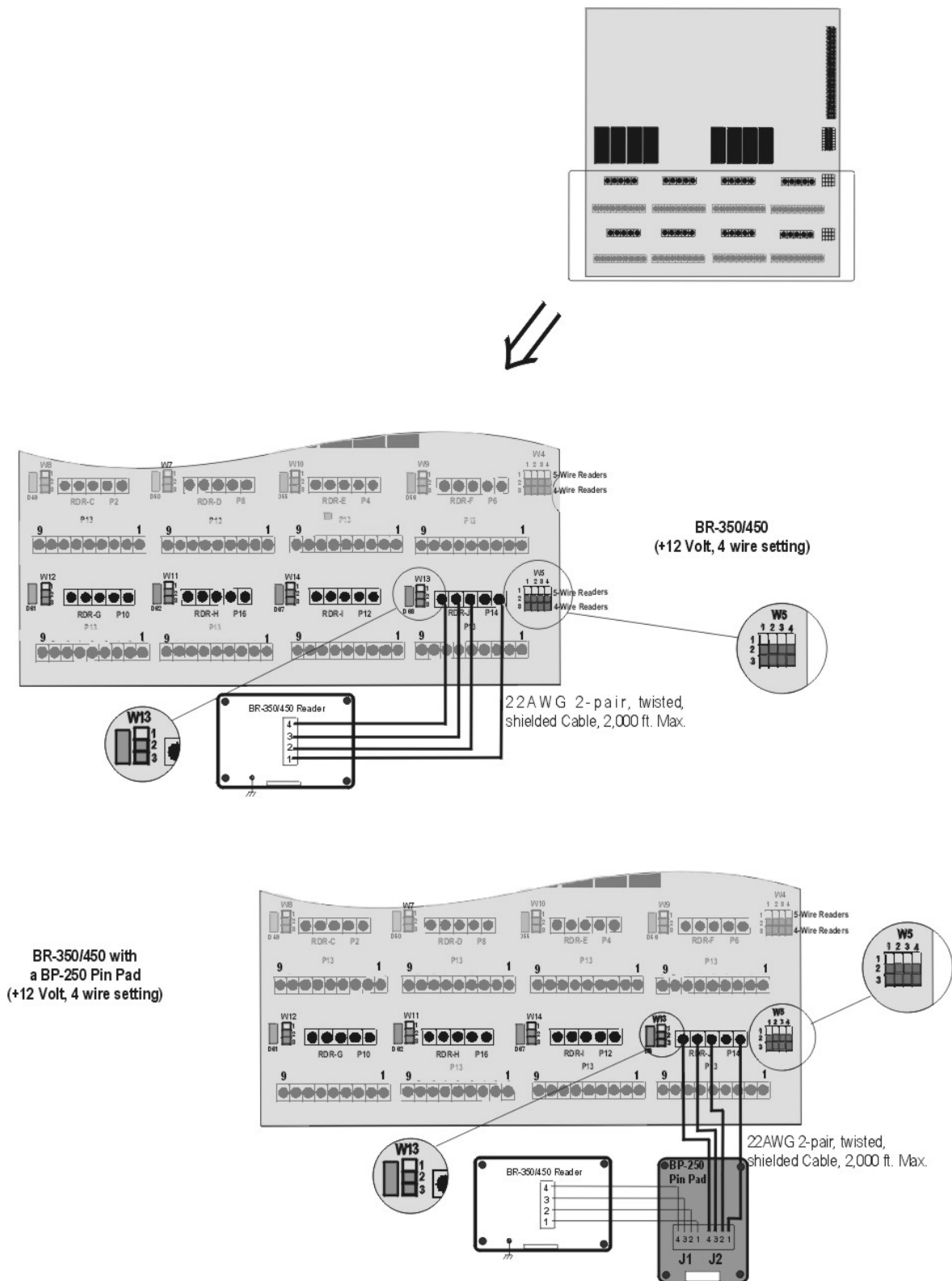
## Reader Connections: BR-350/450 Readers: IQ Board



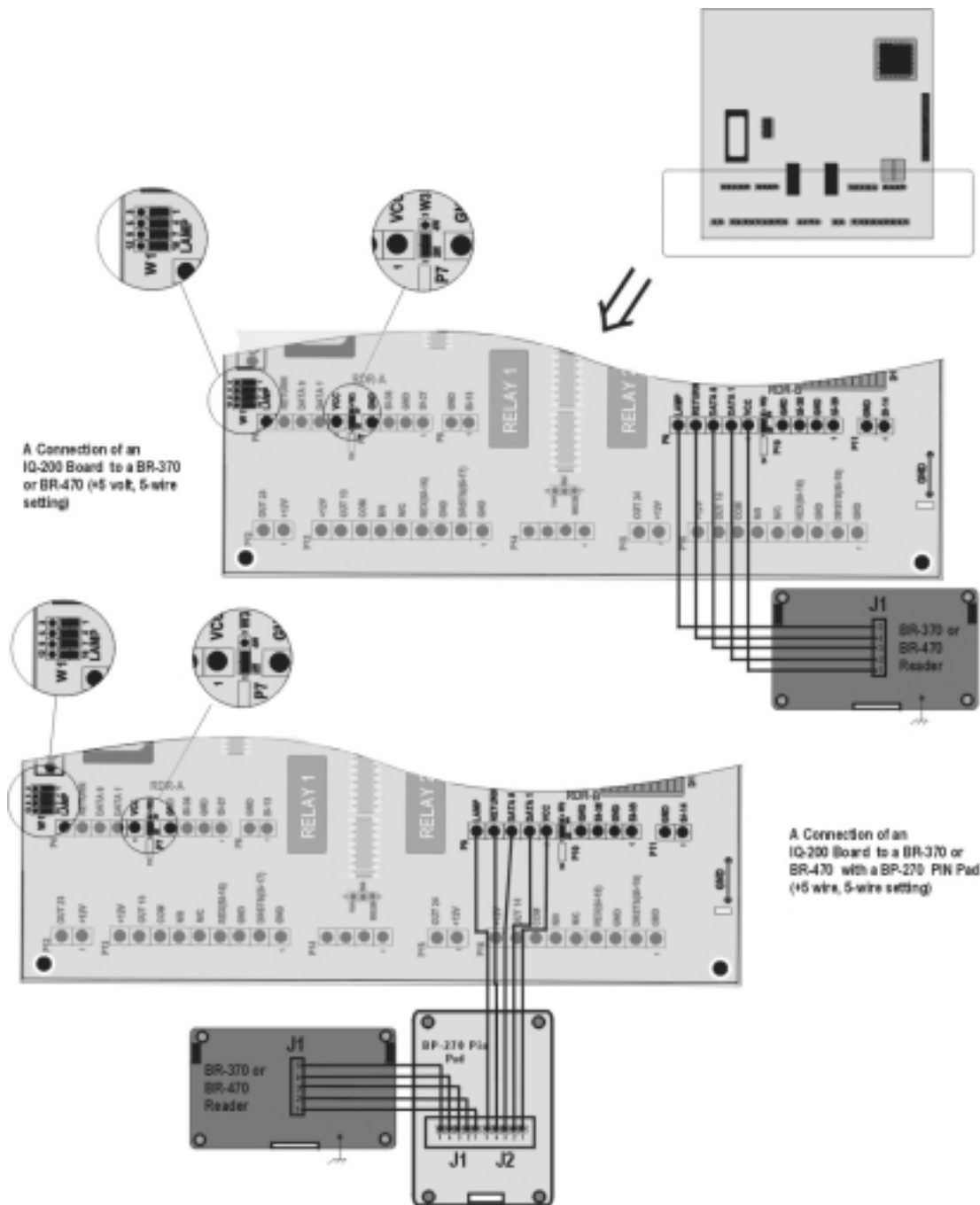
## Reader Connections: BR-350/450 Readers: 4-Reader Expansion Board



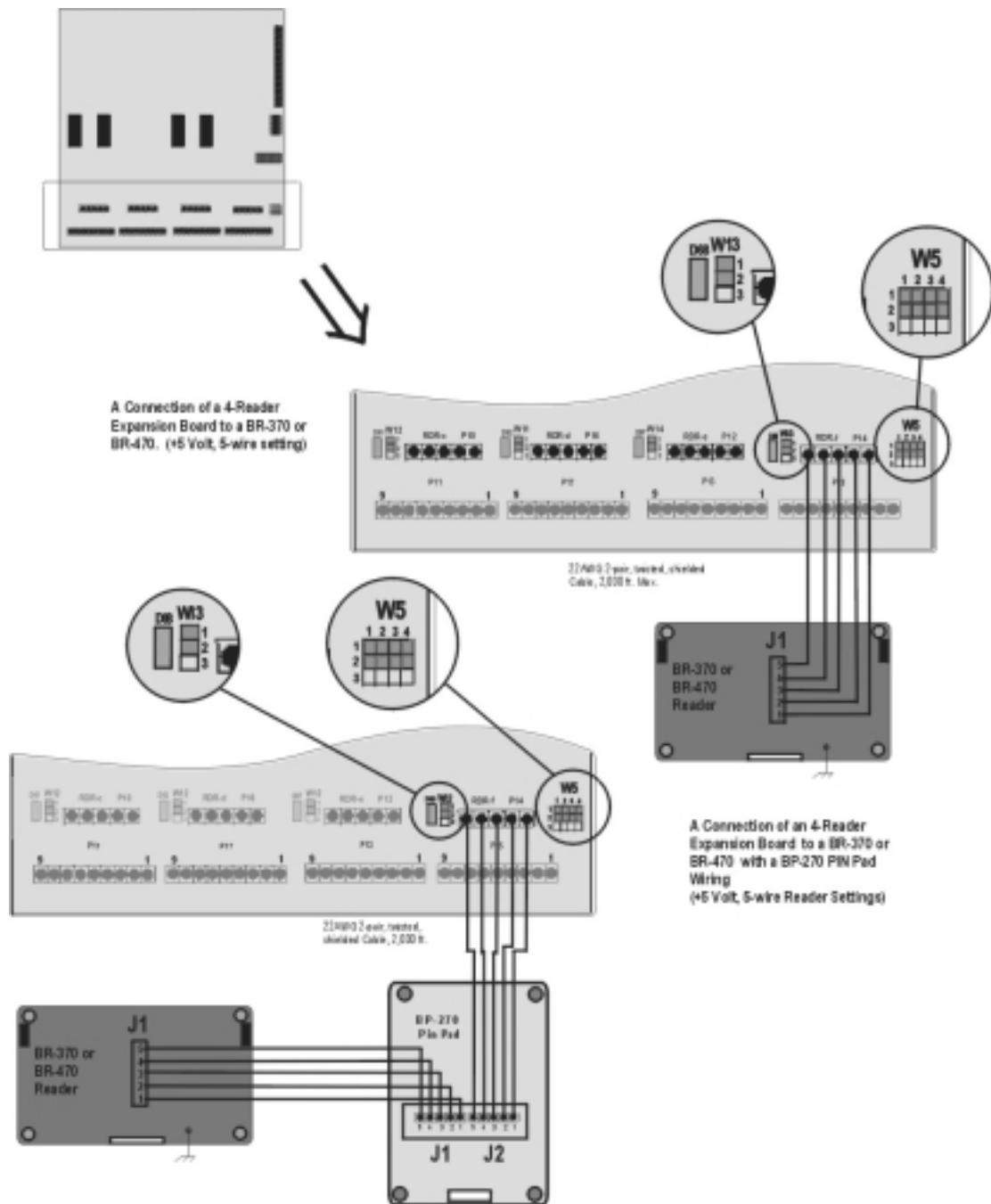
## Reader Connections: BR350/450 Readers: 8-Reader Expansion Board



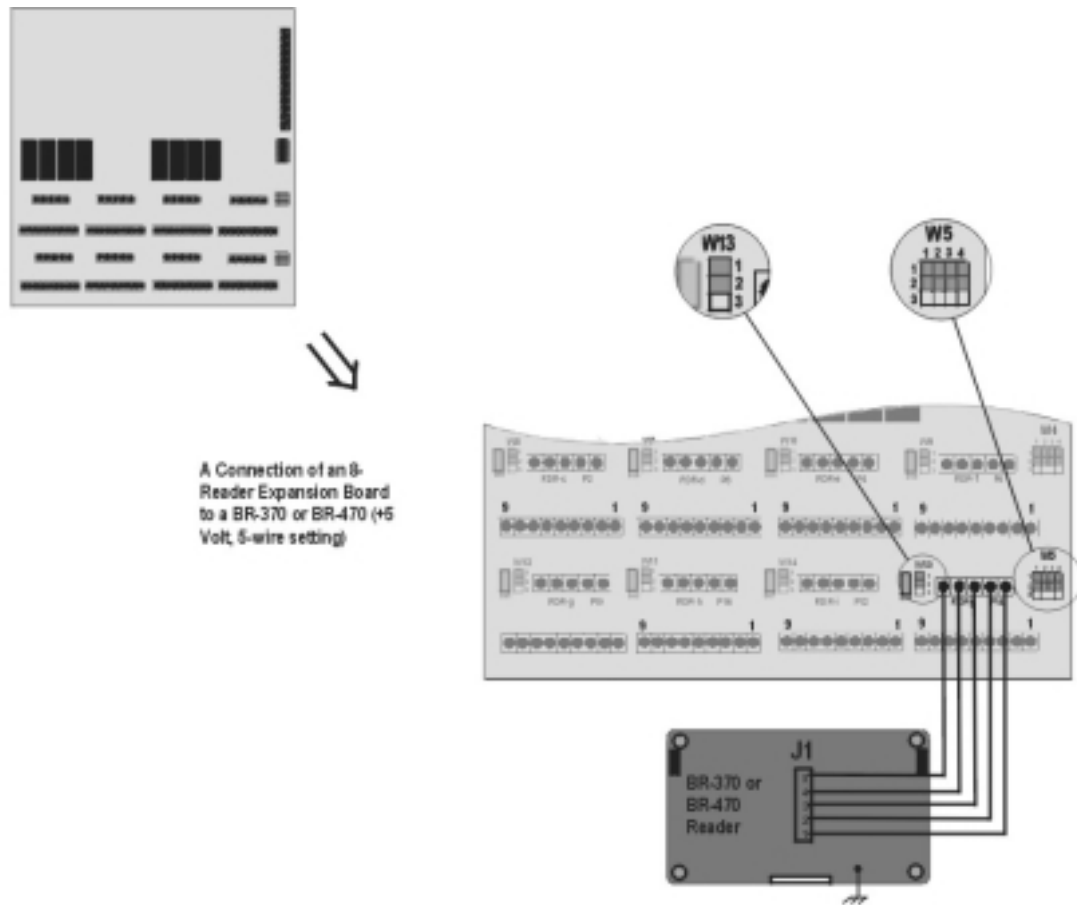
## Reader Connections: BR-370/470: IQ Board



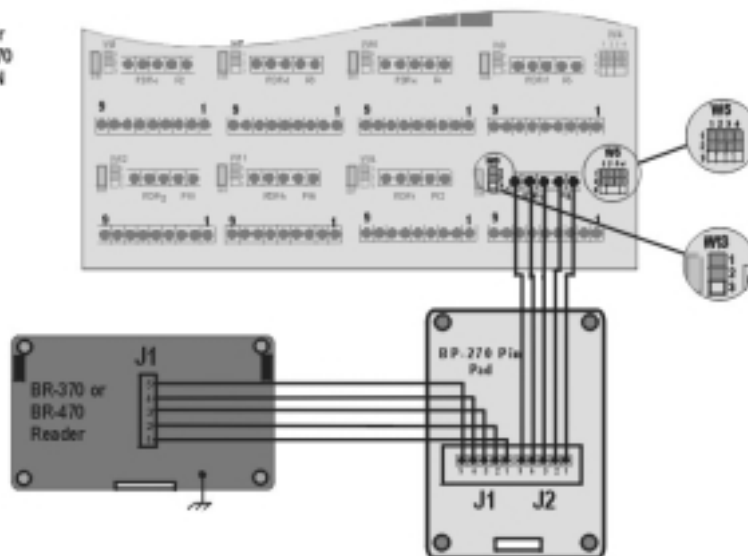
## Reader Connections: BR-370/470 Readers: 4-Reader Expansion Board



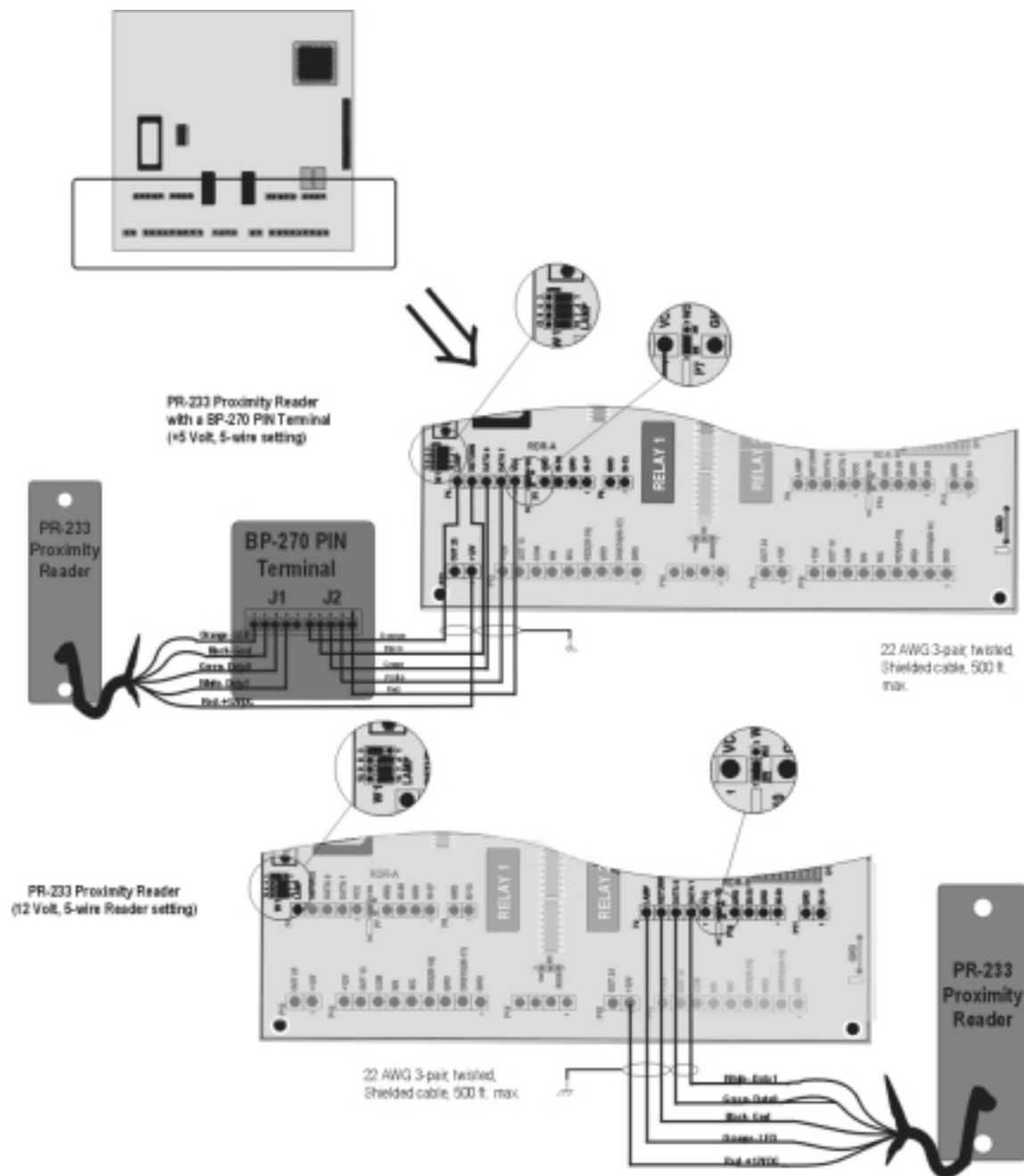
## Reader Connections: BR-370/470 Readers: 8-Reader Expansion Board



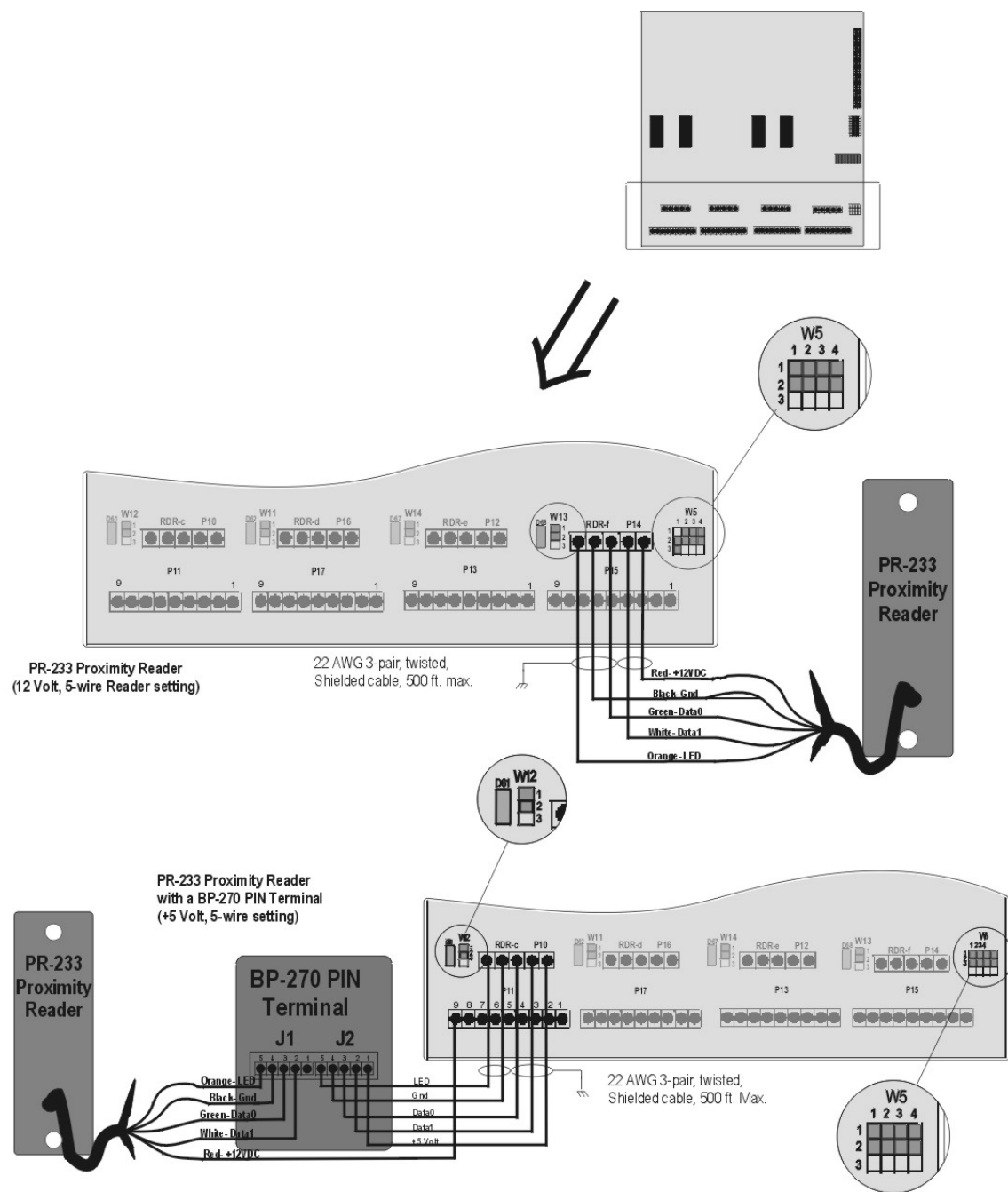
A Connection of an 8-Reader Expansion Board to a BR-370 or BR-470 with a BP-270 PIN Pad Wiring. (+5 Volt, 5-wire setting)



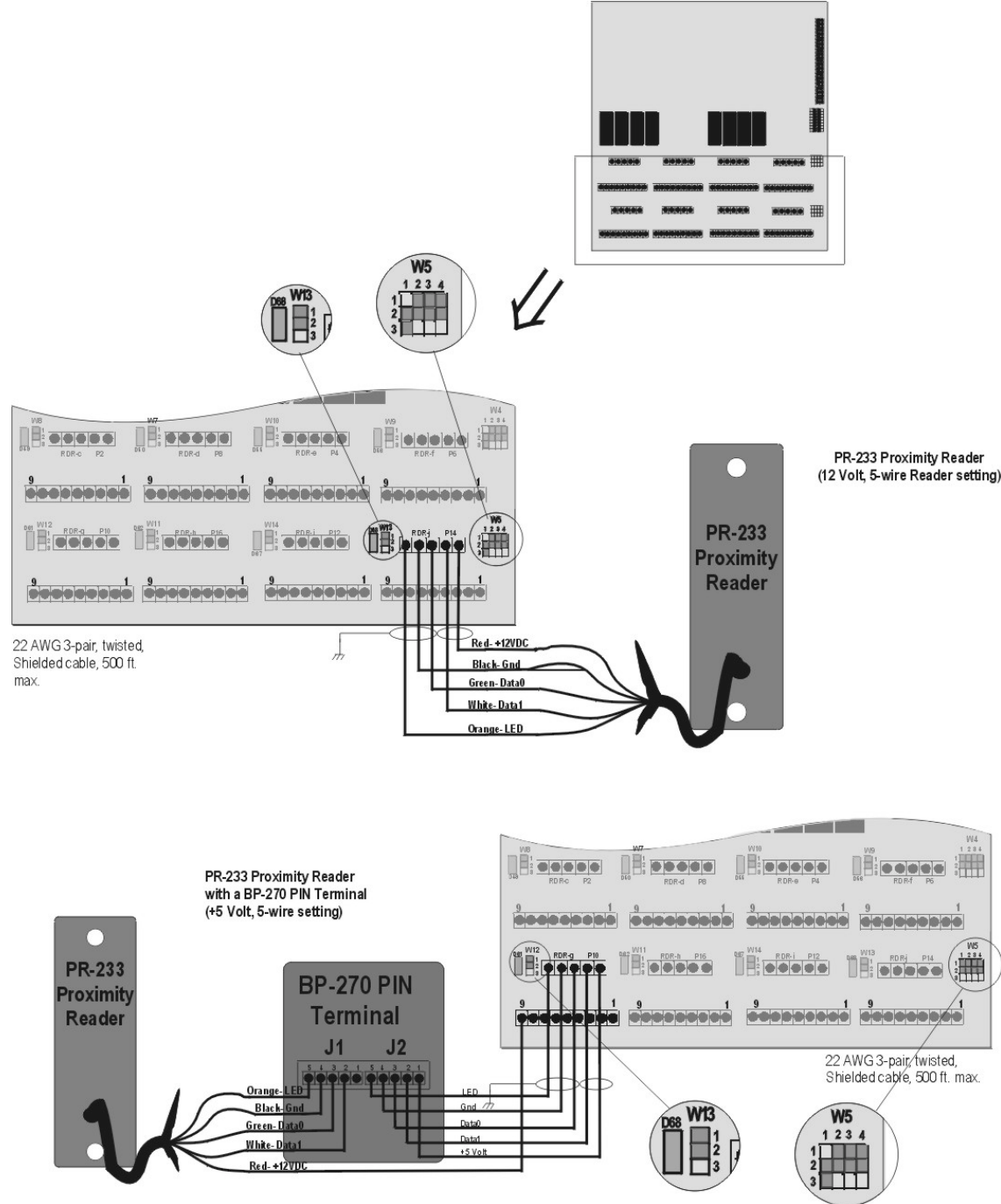
## Reader Connections: PR233 MiniProx: IQ Board



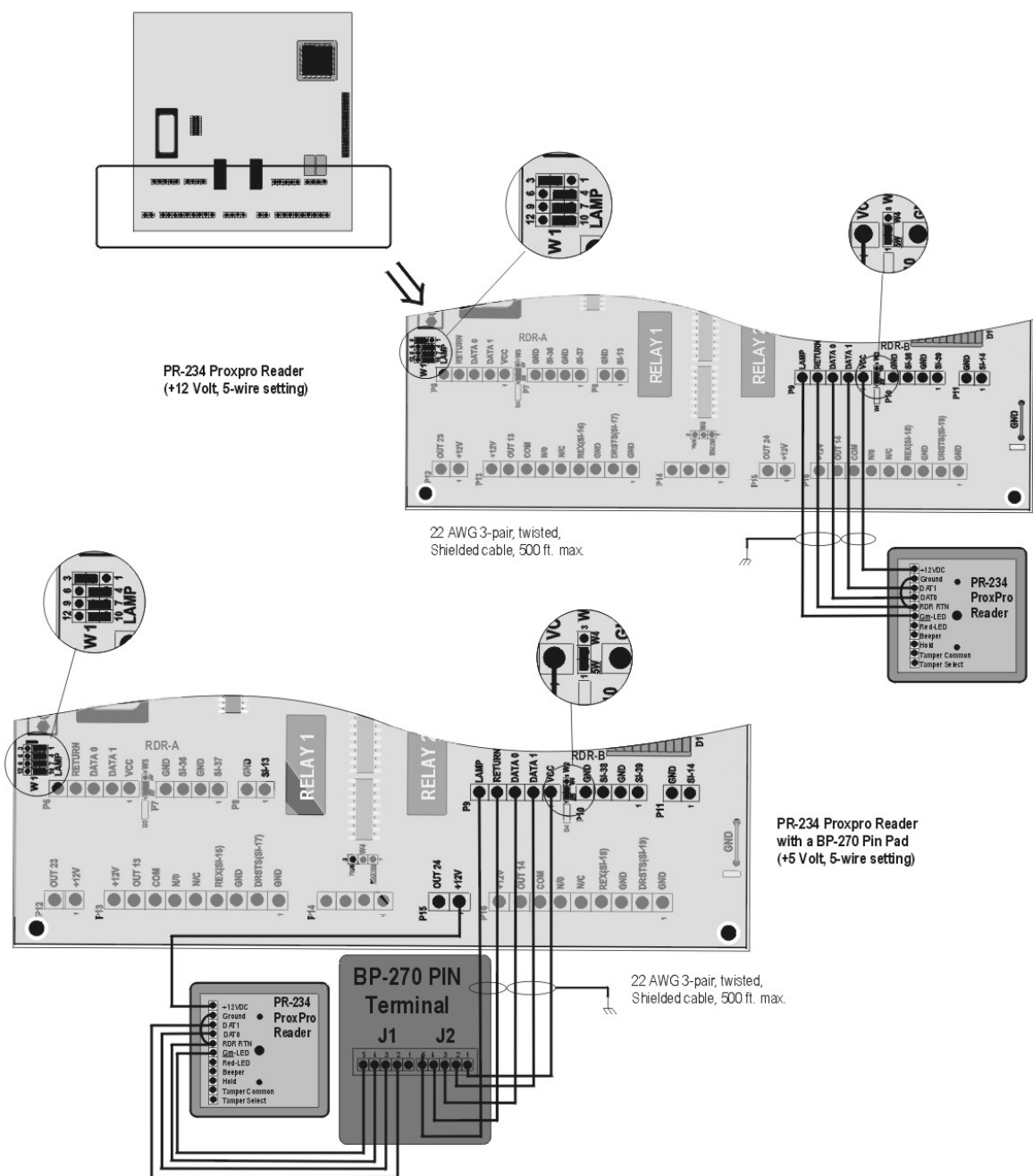
Reader Connections: PR-233 MiniProx: 4-Reader Expansion Board



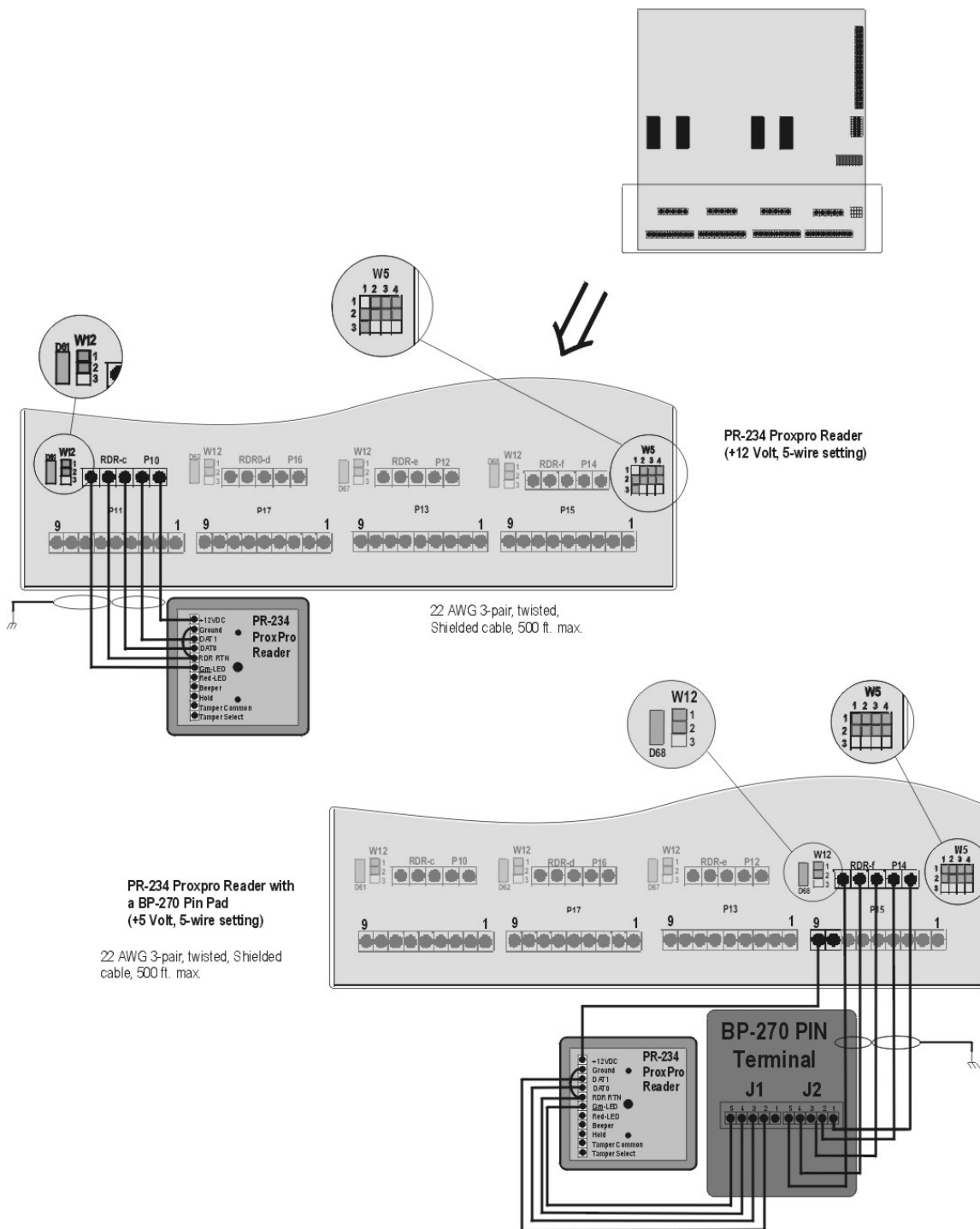
Reader Connection: PR233 MiniProx: 8-Reader Expansion Board



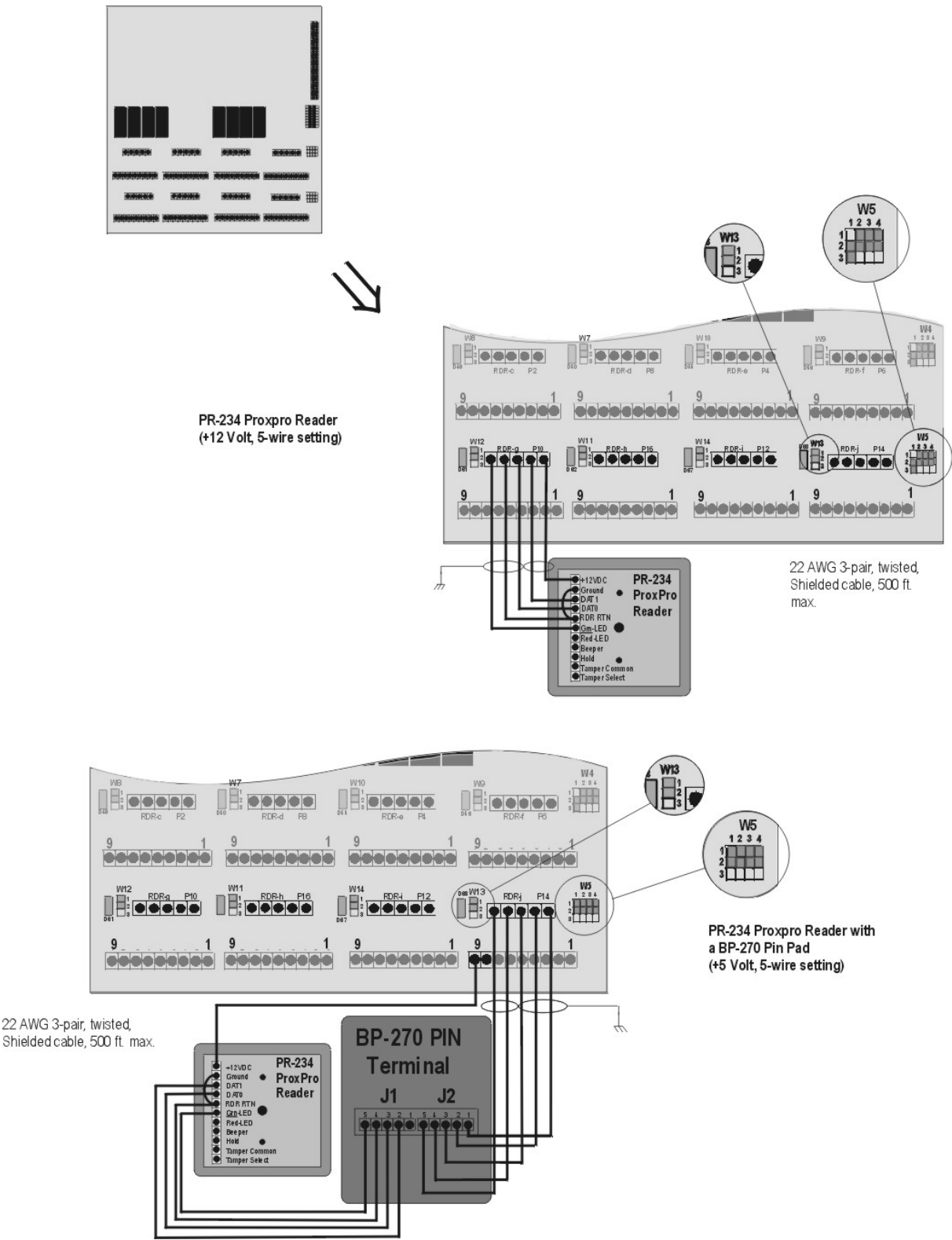
## Reader Connections: PR-234 ProxPro: IQ Board



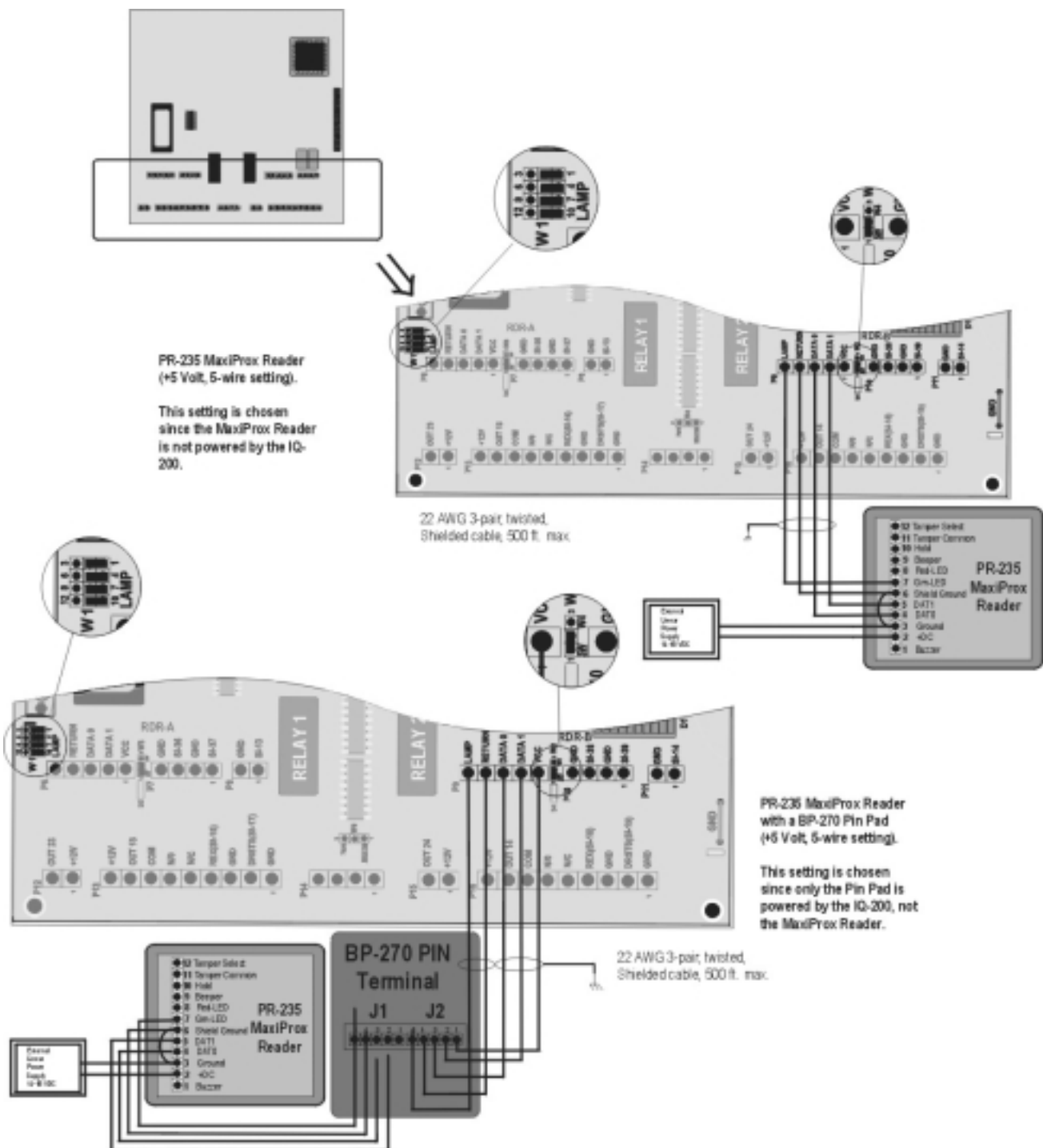
## Reader Connections: PR-234 ProxPro: 4-Reader Expansion Board



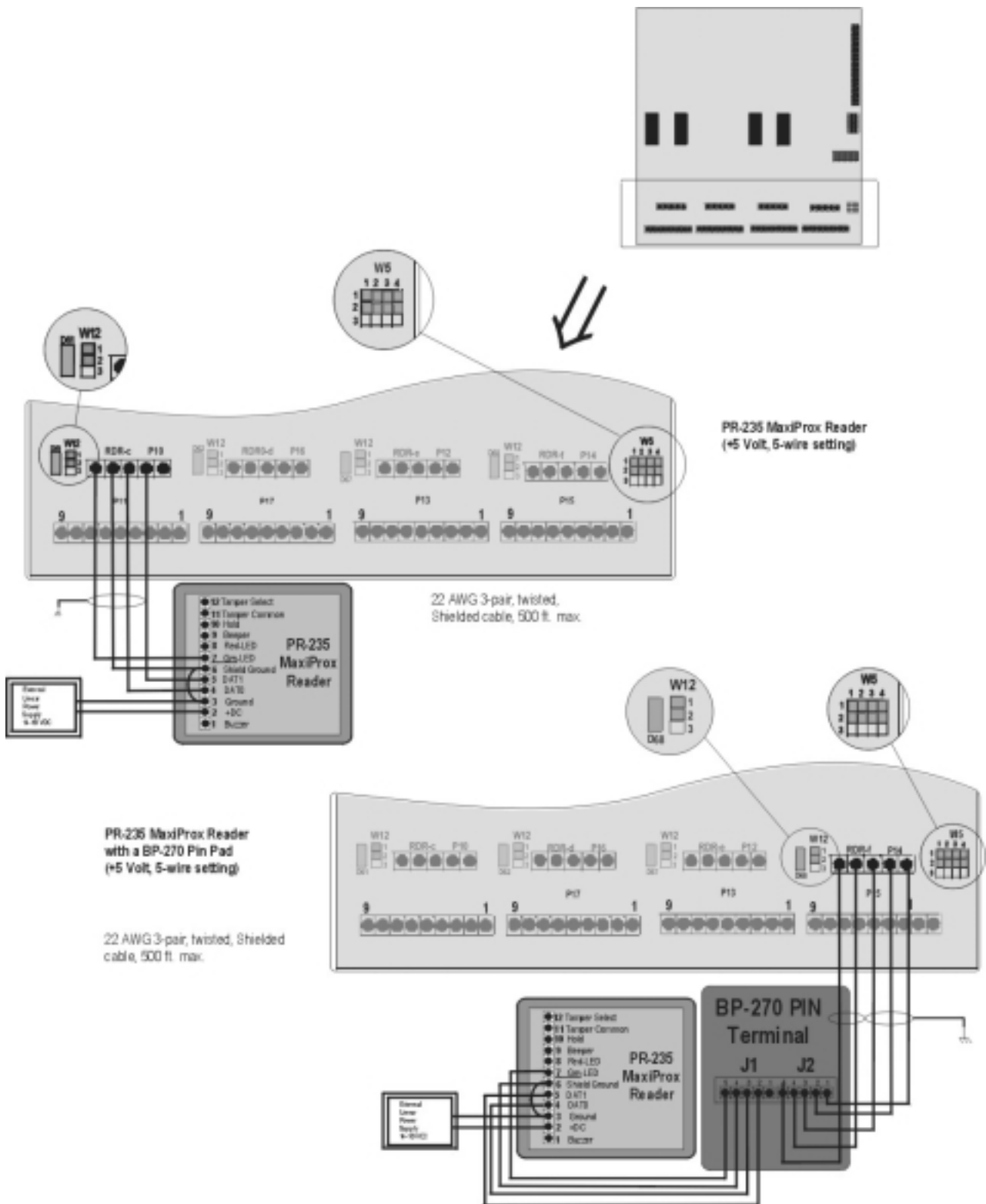
# Reader Connections: PR-234 ProxPro: 8-Reader Expansion Board



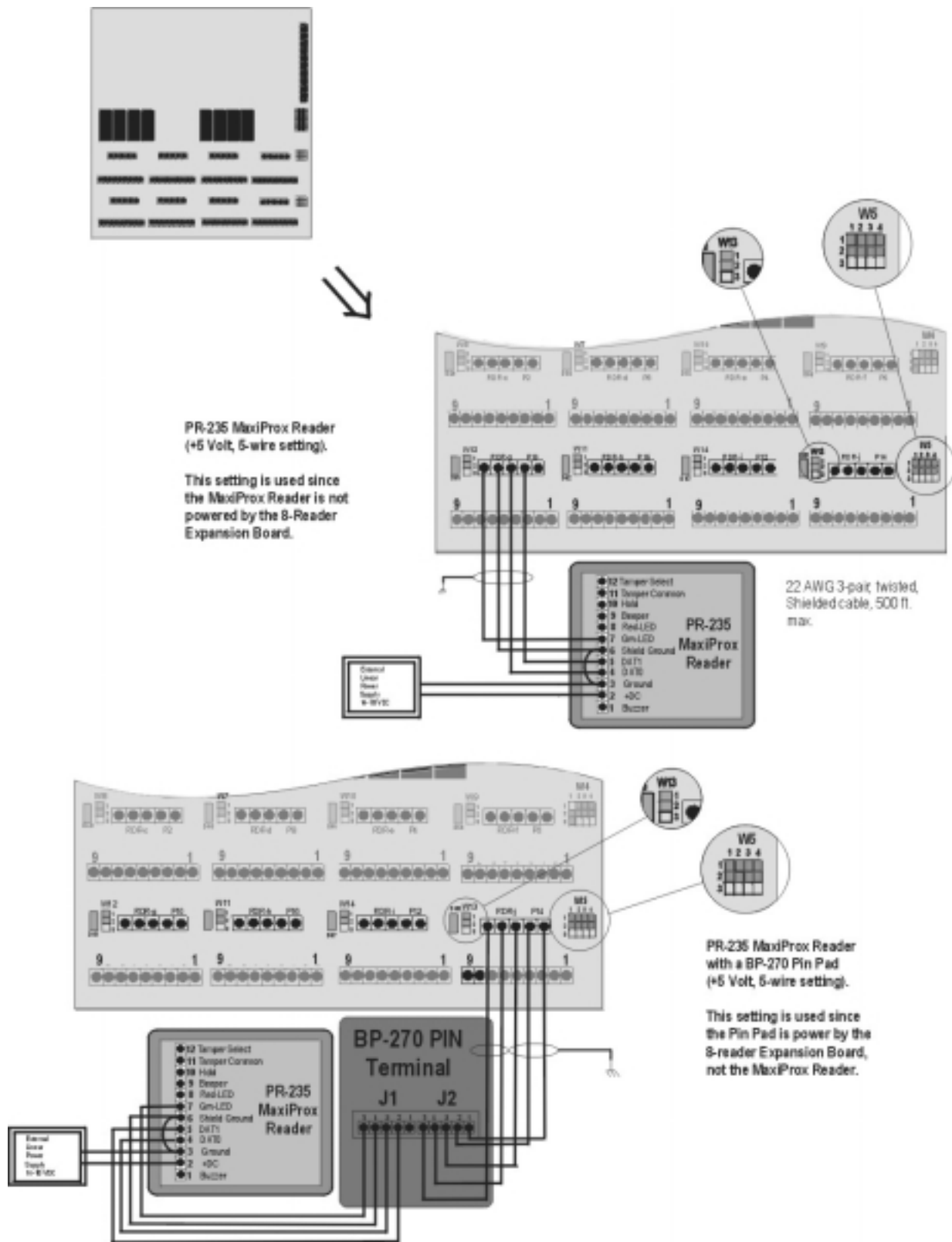
## Reader Connections: PR-235 MaxiProx: IQ Board



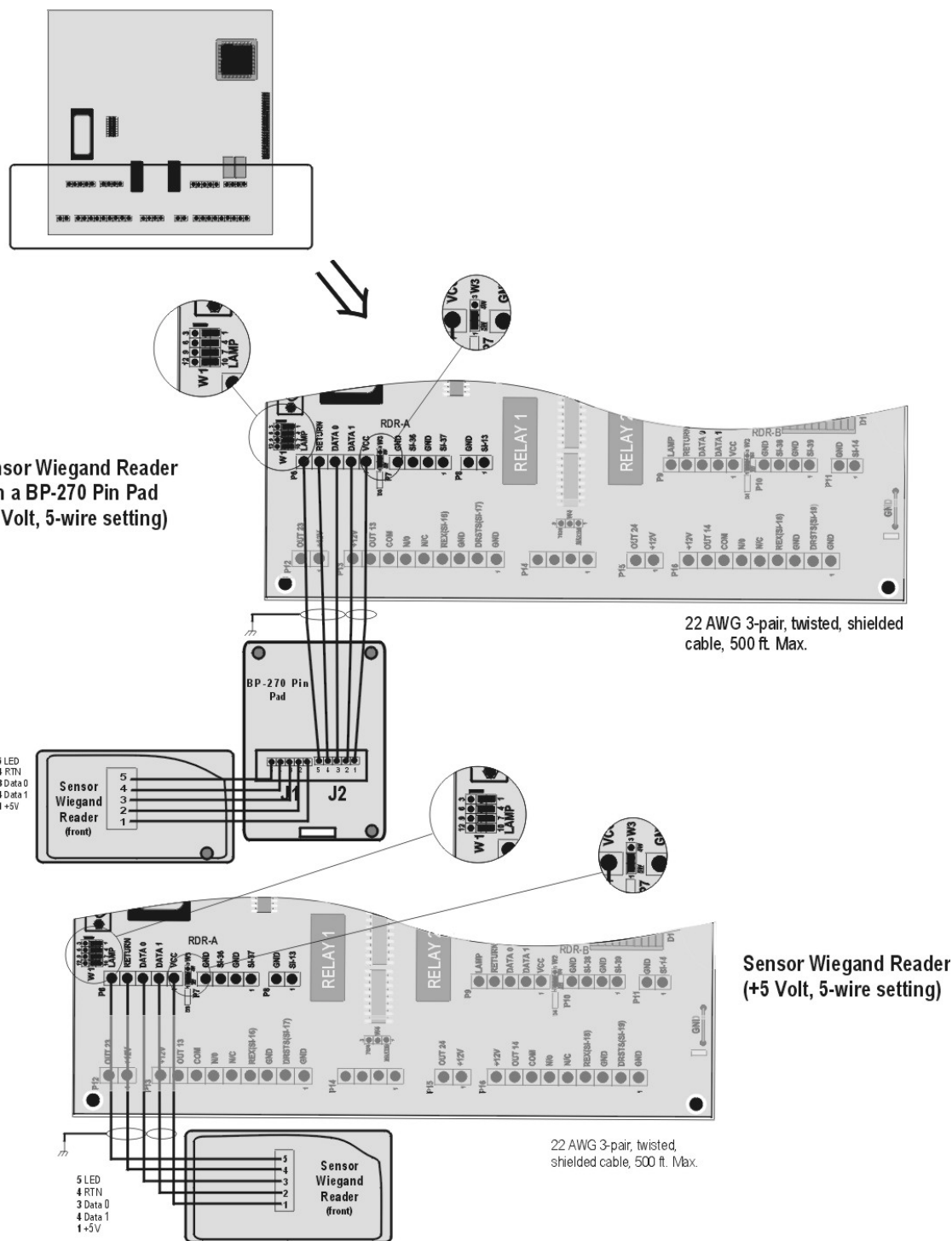
## Reader Connections: PR-235 MaxiProx: 4-Reader Expansion Board



## Reader Connections: PR-235 MaxiProx: 8-Reader Expansion Board



## Reader Connections: Sensor Wiegand: IQ Board



The diagram illustrates two wiring methods for a Sensor Wiegand Reader. Both methods use a 22 AWG 3-pair, twisted, shielded cable (500 ft. Max.) for the Wiegand signal and a 5-wire cable for power.

**Top Configuration: Sensor Wiegand Reader (+5 Volt, 5-wire setting)**

- The reader is connected directly to a power source (represented by a rack unit).
- The Wiegand signal cable (W13) is connected to the reader's W13 terminal.
- The power cable (W12) is connected to the reader's W12 terminal.
- The reader's W12 terminal is also connected to the power source's W12 terminal.

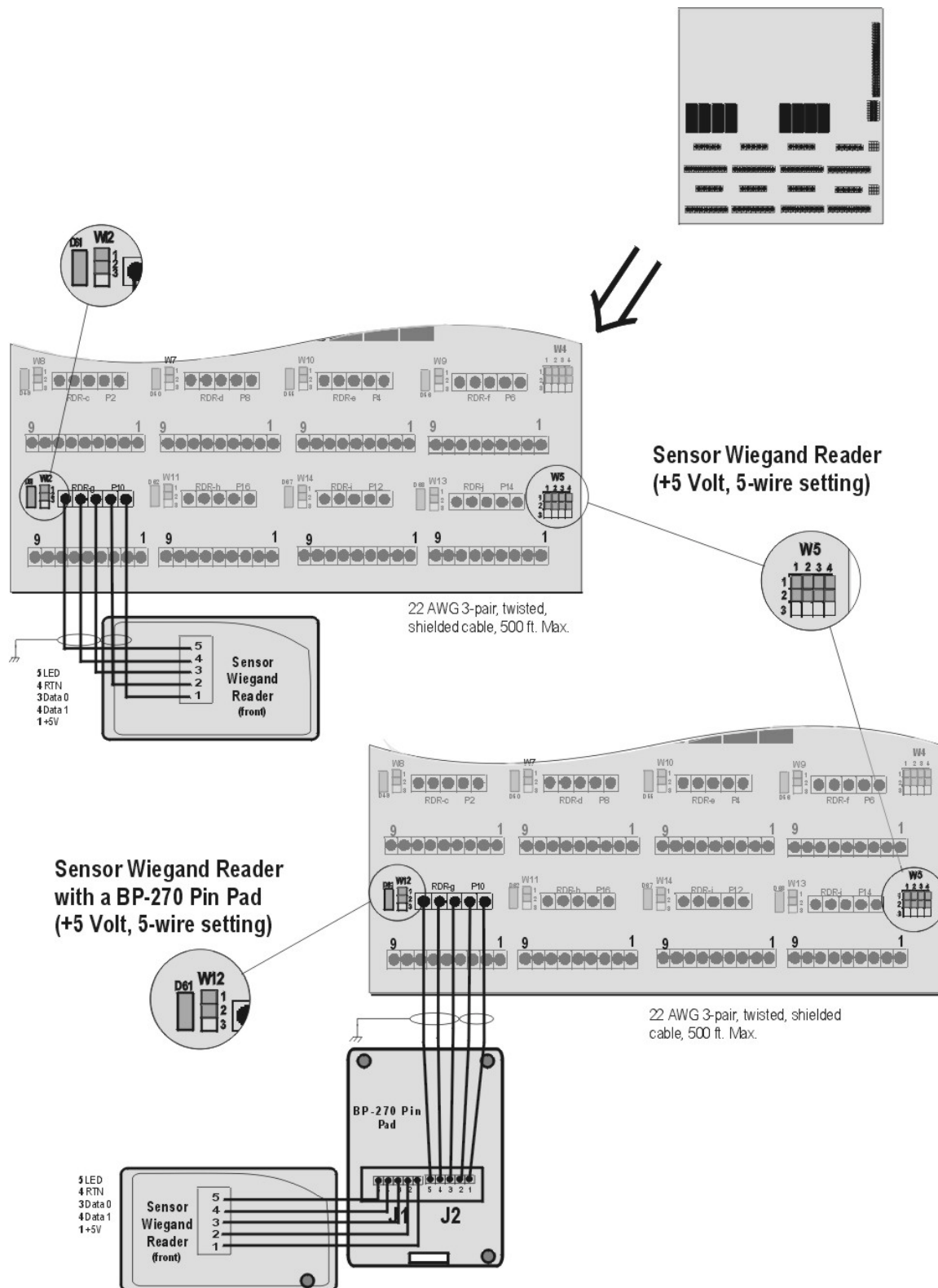
**Bottom Configuration: Sensor Wiegand Reader with a BP-270 Pin Pad (+5 Volt, 5-wire setting)**

- The reader is connected to a BP-270 Pin Pad.
- The Wiegand signal cable (W13) is connected to the reader's W13 terminal and the BP-270 Pin Pad's W13 terminal.
- The power cable (W12) is connected to the reader's W12 terminal and the BP-270 Pin Pad's W12 terminal.
- The BP-270 Pin Pad's W12 terminal is also connected to the power source's W12 terminal.

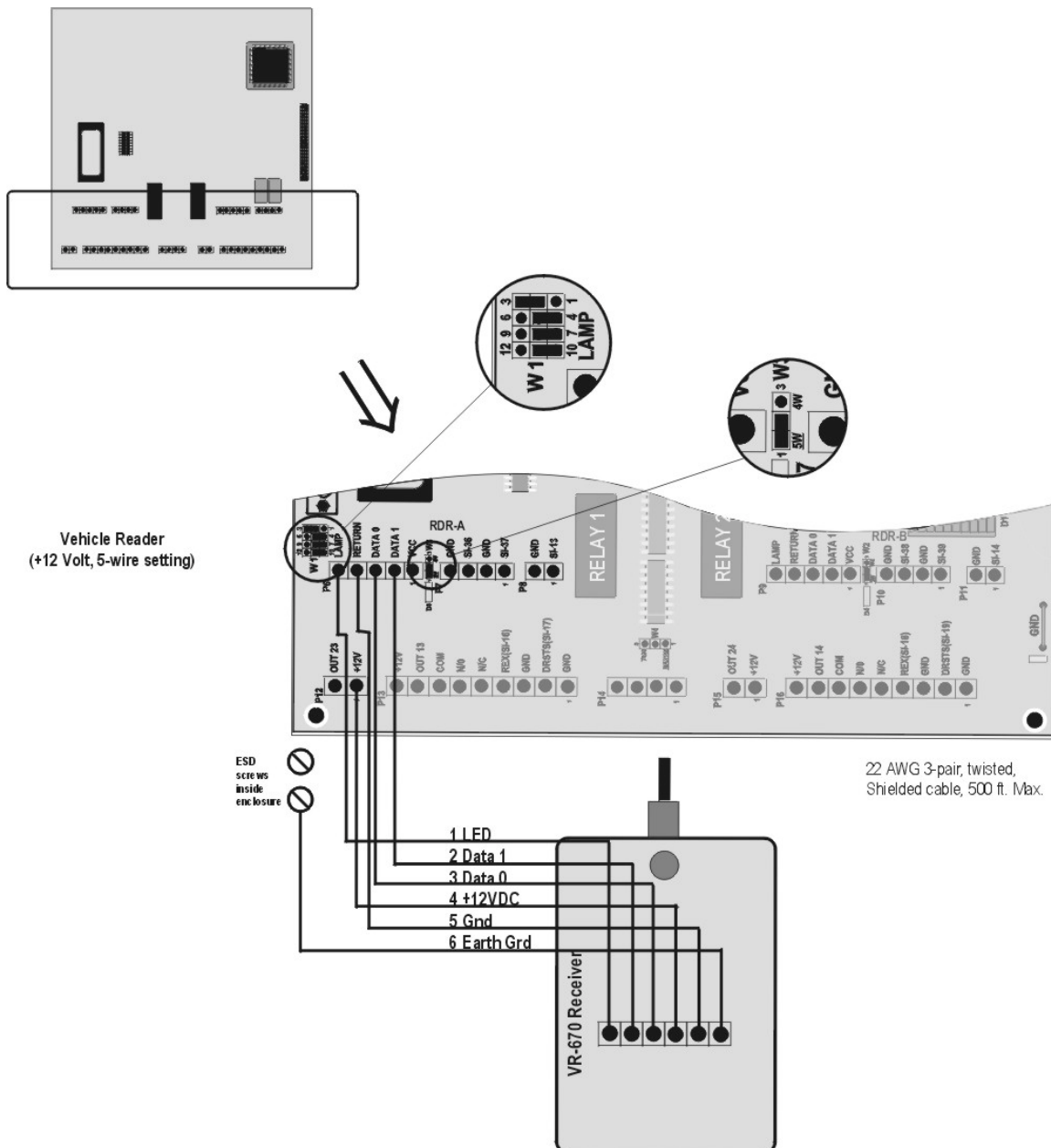
**Wiring Details:**

- Wiegand Signal Cable (W13):** 22 AWG 3-pair, twisted, shielded cable, 500 ft. Max.
- Power Cable (W12):** 5-wire cable, 500 ft. Max.
- Reader Settings:** +5 Volt, 5-wire setting.

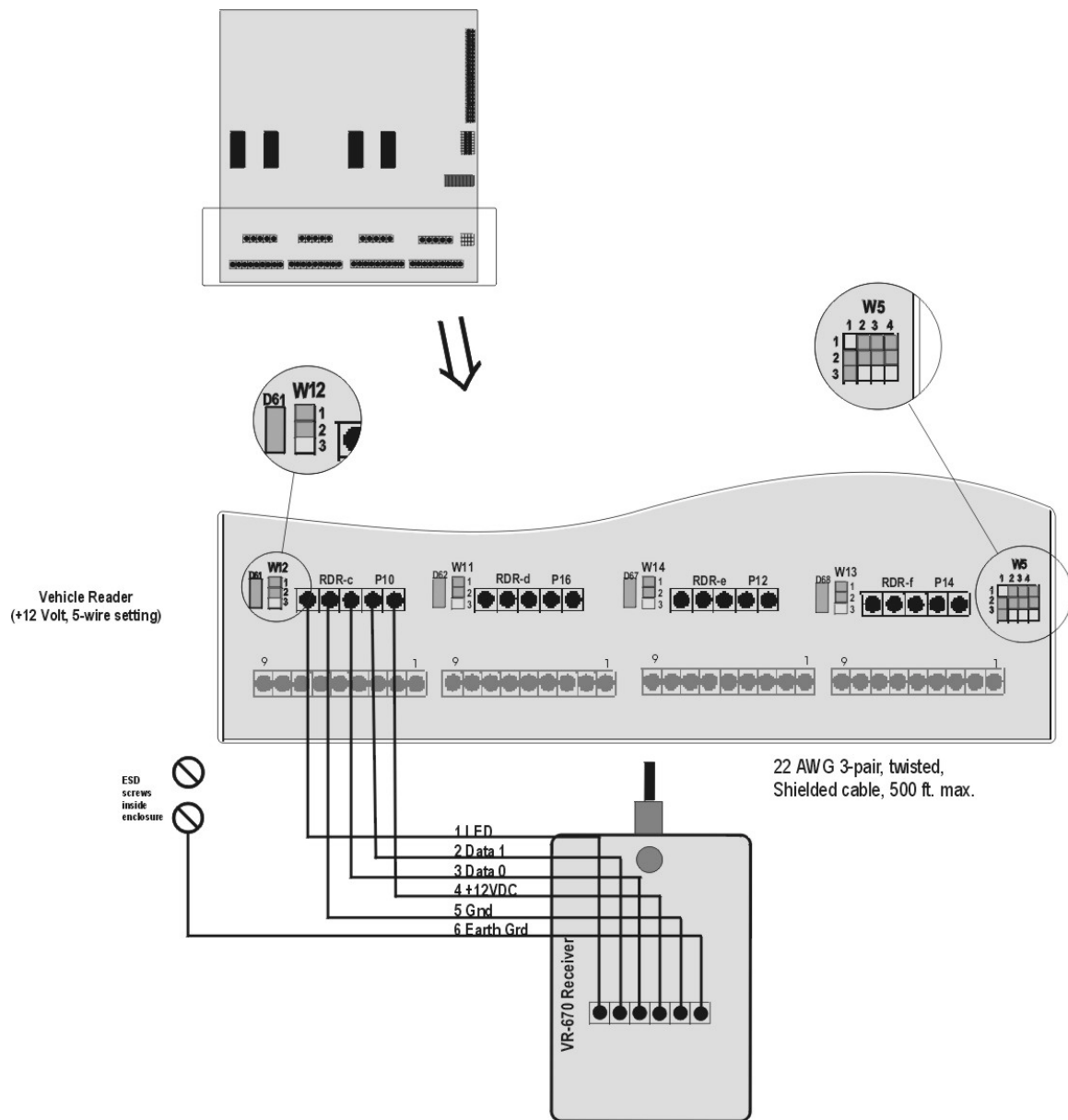
## Reader Connections: Sensor Wiegand: 8-Reader Expansion Board



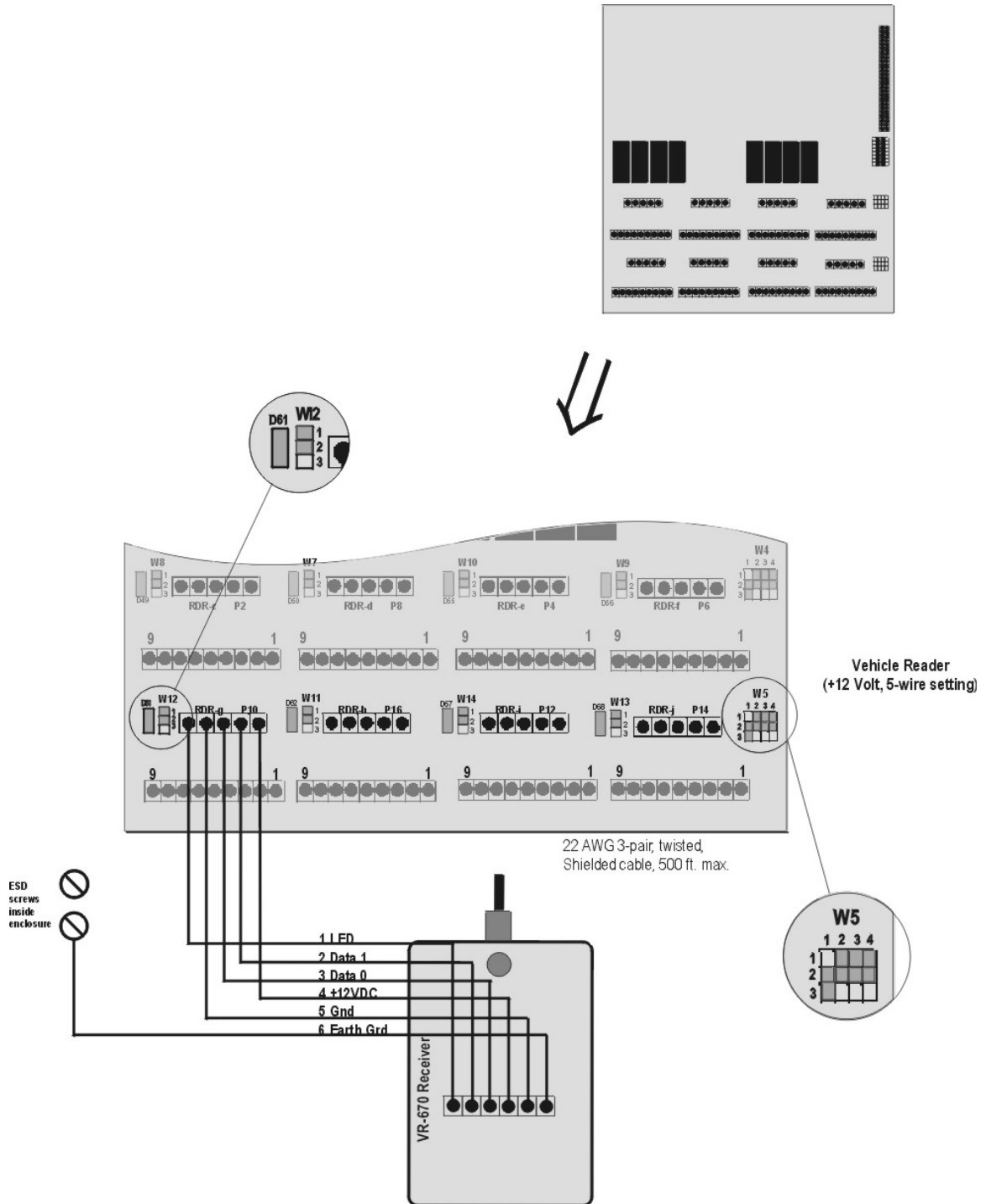
## Reader Connections: Vehicle Readers: IQ Board



## Reader Connections: Vehicle Readers: 4-Reader Expansion Board



## Reader Connections: Vehicle Readers: 8-Reader Expansion Board



## Step 4-Wiring the Door(s)





## Step 4 Wiring the Door(s)

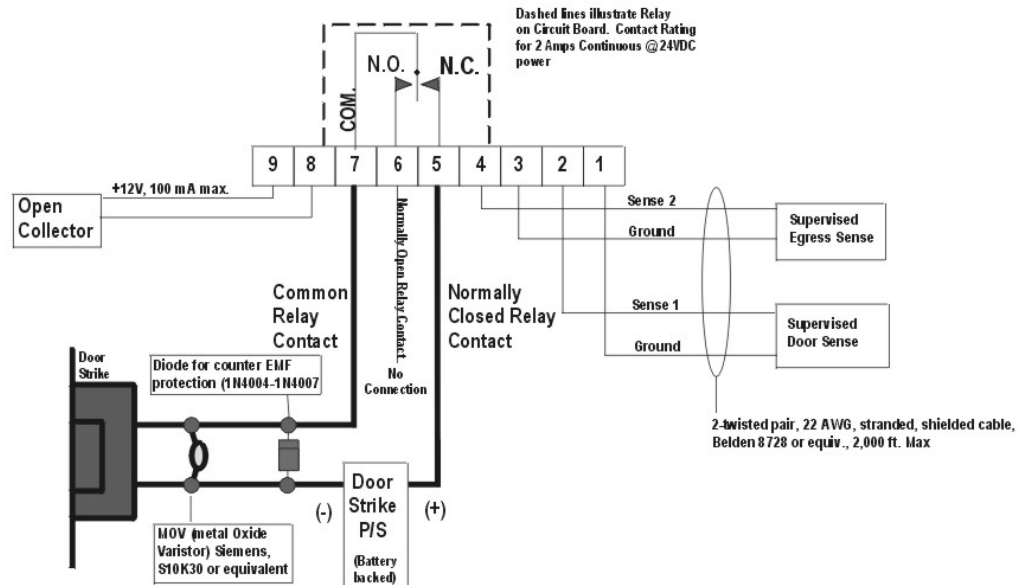
- Step 1. It is important to realize that when power is interrupted from the IQ-200 that the door relay **de-energizes** and continuity (conduction path) exists between the Common (Com.) and Normally Closed (N.C.) relay contacts. Should this loss-of-power situation arise, it must be determined whether the door(s) controlled by the IQ-200 will become unlocked (or a Fail Safe environment), or locked (or a Fail Secure environment).
- Step 2. Refer to the two types of door hardware below and the circuit conditions that coincide with the state of the locks.
- Case A.** Door Strike hardware requires continuity to unlock (for strikes that require power to lock, follow the outline given for maglocks). This is provided by a closed circuit condition (Normally Closed **[N.C.]**).
- Case B.** Door Strike hardware does NOT require continuity to lock (for strikes that require power to lock, follow the outline given for maglocks). This is provided by an open circuit condition (Normally Open **[N.O.]**).
- Case C.** Magnetic lock hardware requires continuity to lock. This is provided by a closed circuit condition (Normally Closed **[N.C.]**).
- Case D.** Magnetic lock hardware does NOT require continuity to unlock. This is provided by an open circuit condition (Normally Open **[N.O.]**).
- Step 3. For **Fail Safe** operation, wire the appropriate door lock hardware to accommodate an **unlocked** condition upon interruption of IQ-200 power. This is implemented by:
- For door strikes, wire between the Common and Normally Closed Door Relay contacts.
  - For Magnetic Locks, wire between the Common and Normally Open Door Relay contacts.
- For **Fail Secure** operation, wire the appropriate door lock hardware to accommodate a locked condition upon interruption of IQ-200 power. This is implemented by:
- For door strikes, wire between the Common and Normally Open Door Relay contacts.
  - For Magnetic Locks, wire between the Common and Normally Closed Door Relay contacts.
- \* For both conditions (Fail Safe and Fail Secure) it is presumed that Lock Power is battery backed**
- Step 4. Program the quiescent (INACTIVE) state of the door output relay to provide a locked door state. For **Fail Safe** environments, the quiescent state of the door output relay should be ENERGIZED. For **Fail Secure** environments, it should be DE-ENERGIZED.

Consult the **LiNC-NET Administrator Manual (P/N: 38-10049-001) Door Overview/Hardware** section for programming information.

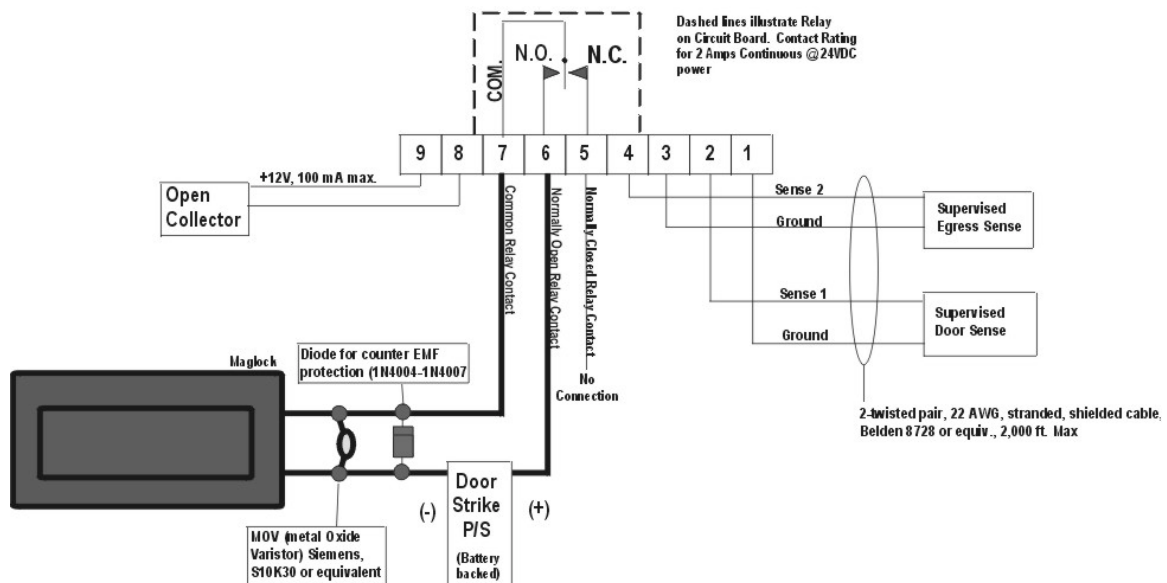
**Open Collector Output:** Open collector outputs are designed to drive an external relay. This technique can be used to control devices which exceeds the relay capacity of those on board the IQ-200. The open collector outputs are capable of 100 mA current @ 12VDC.

## Panel in a Fail-Safe Environment

### Example of the IQ-200 with a Doorstrike in a Fail-Safe Environment

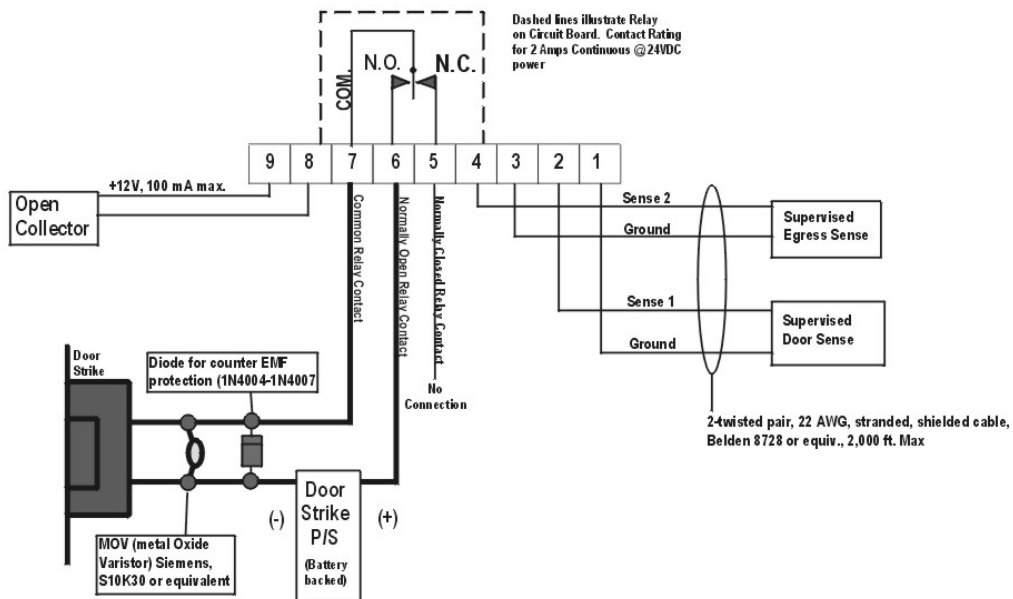


### Example of the IQ-200 with a Maglock in a Fail-Safe Environment

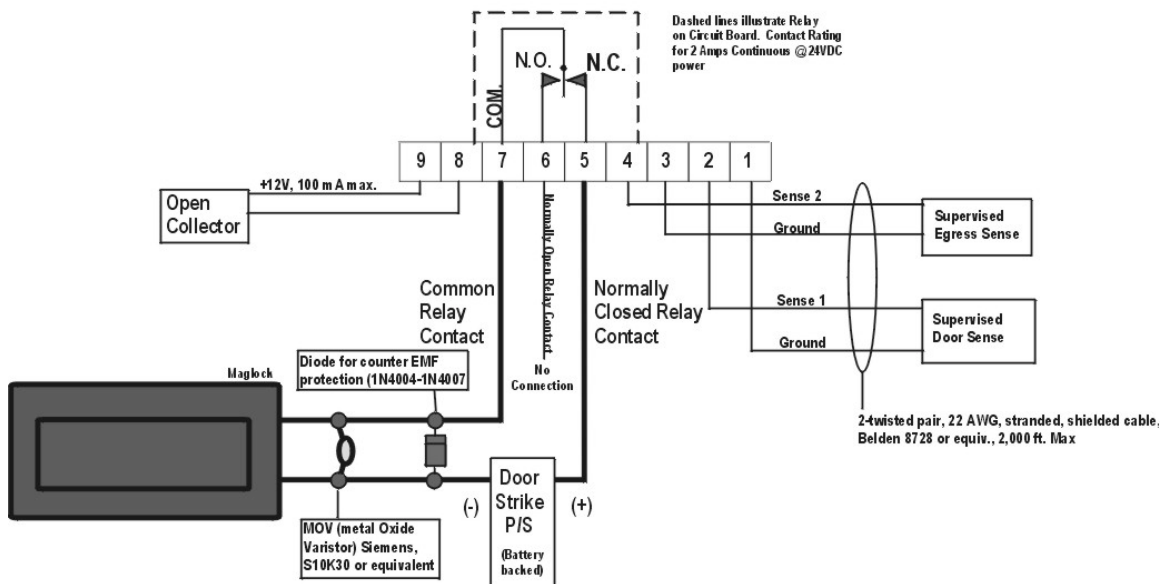


## Panel in a Fail-Secure Environment

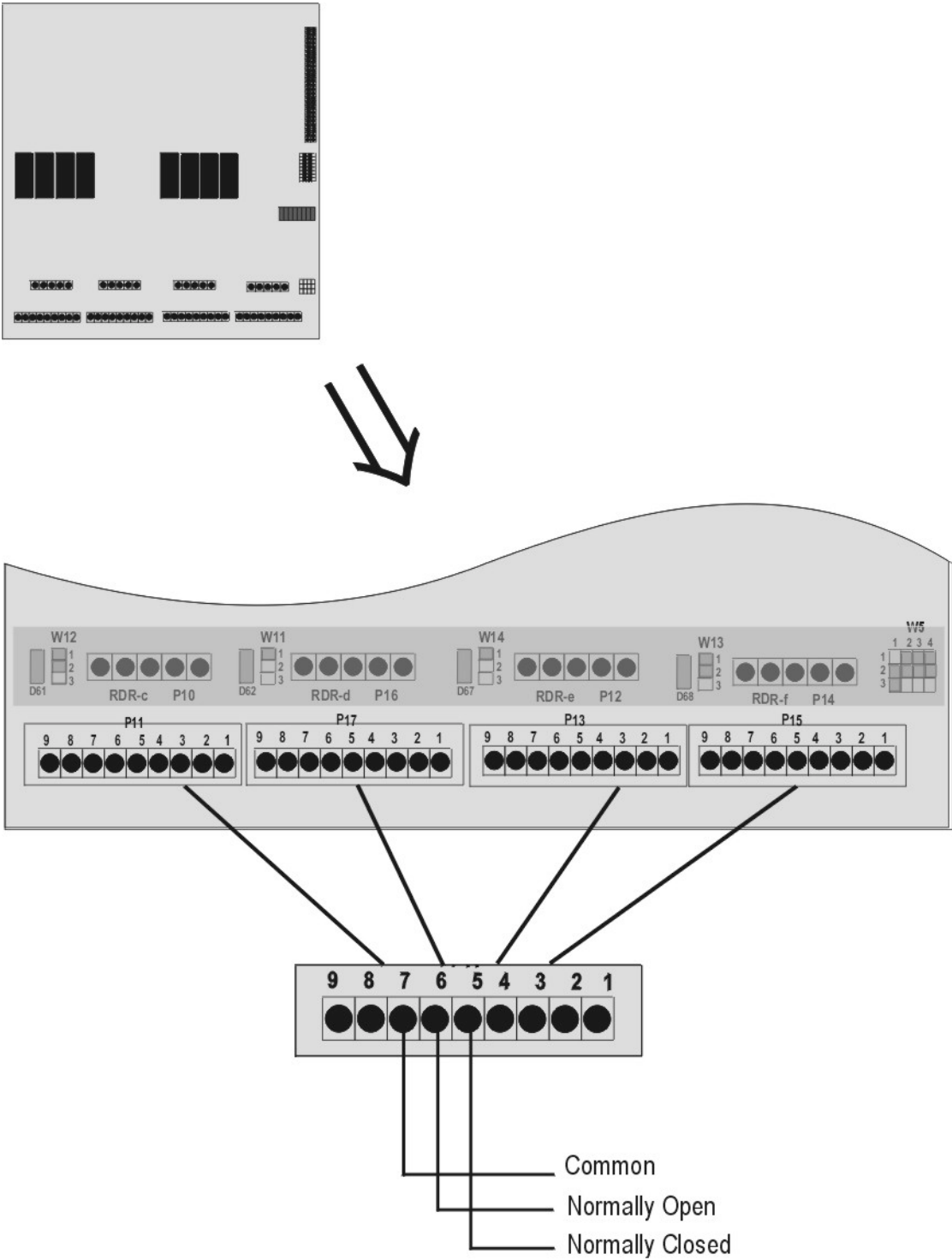
Example of the IQ-200 with a Doorstrike in a Fail-Secure Environment



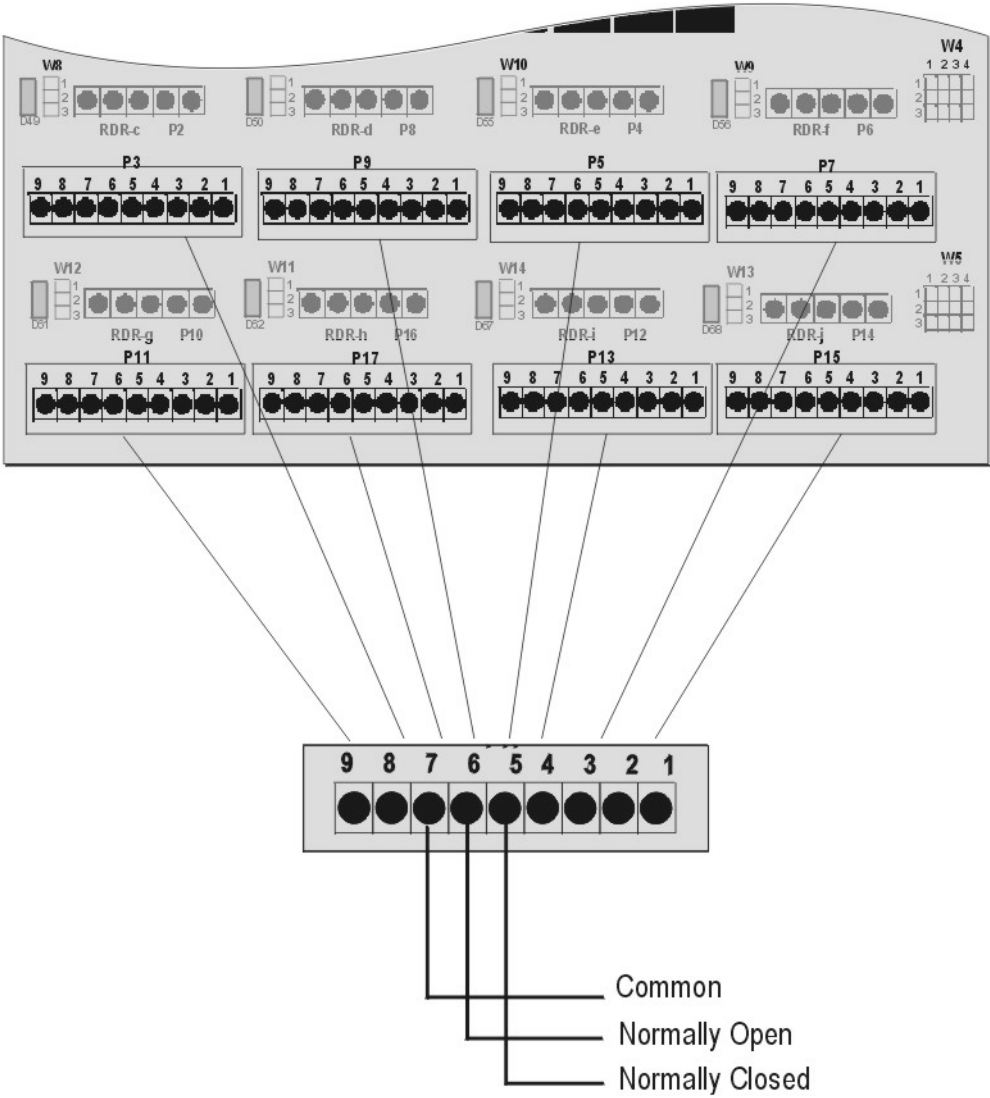
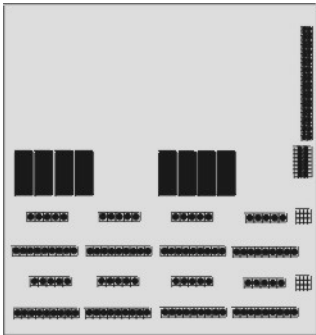
Example of the IQ-200 with a Maglock in a Fail-Secure Environment



4-reader Expansion Module Door lock/strike

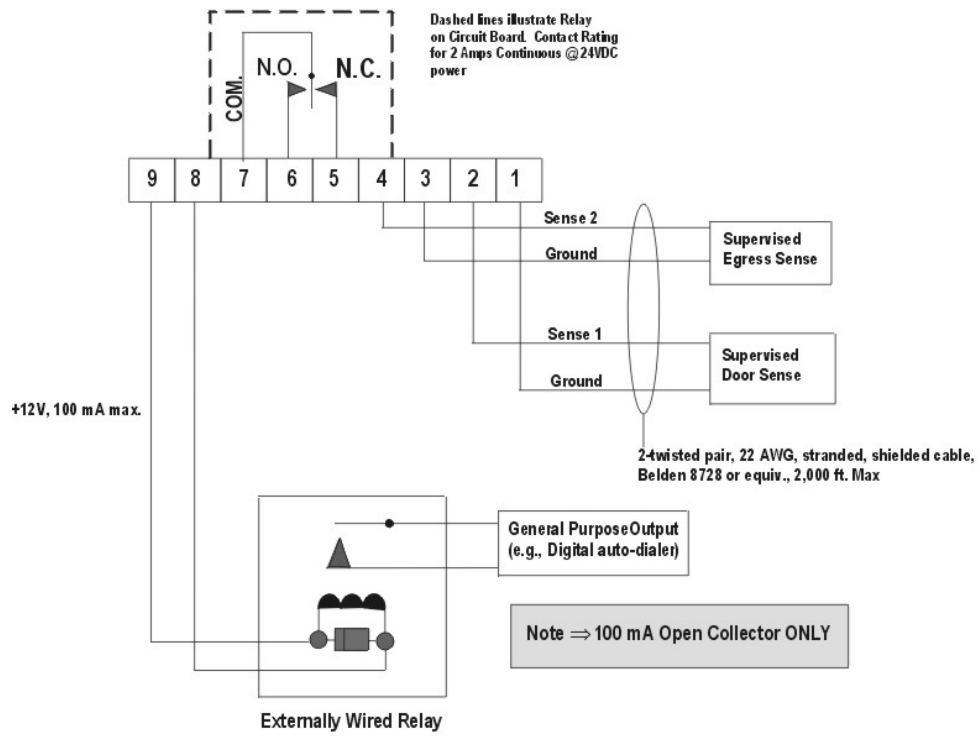


8-reader Expansion Module Door lock/strike

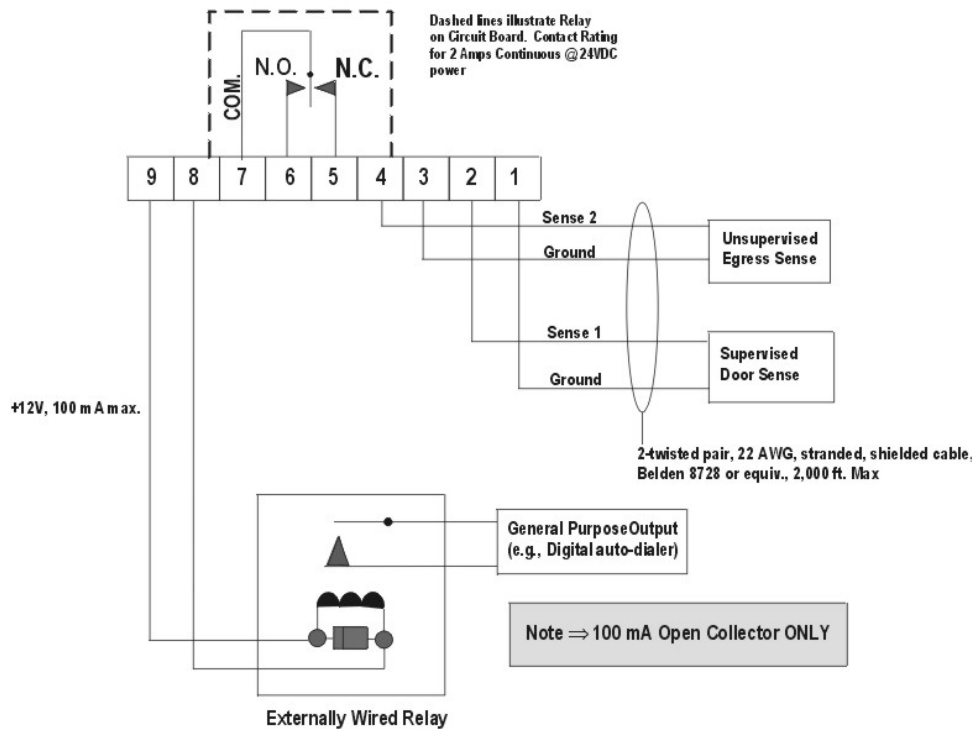


## Open Collector Output for IQ-200 and 4 and 8-reader Expansion Module

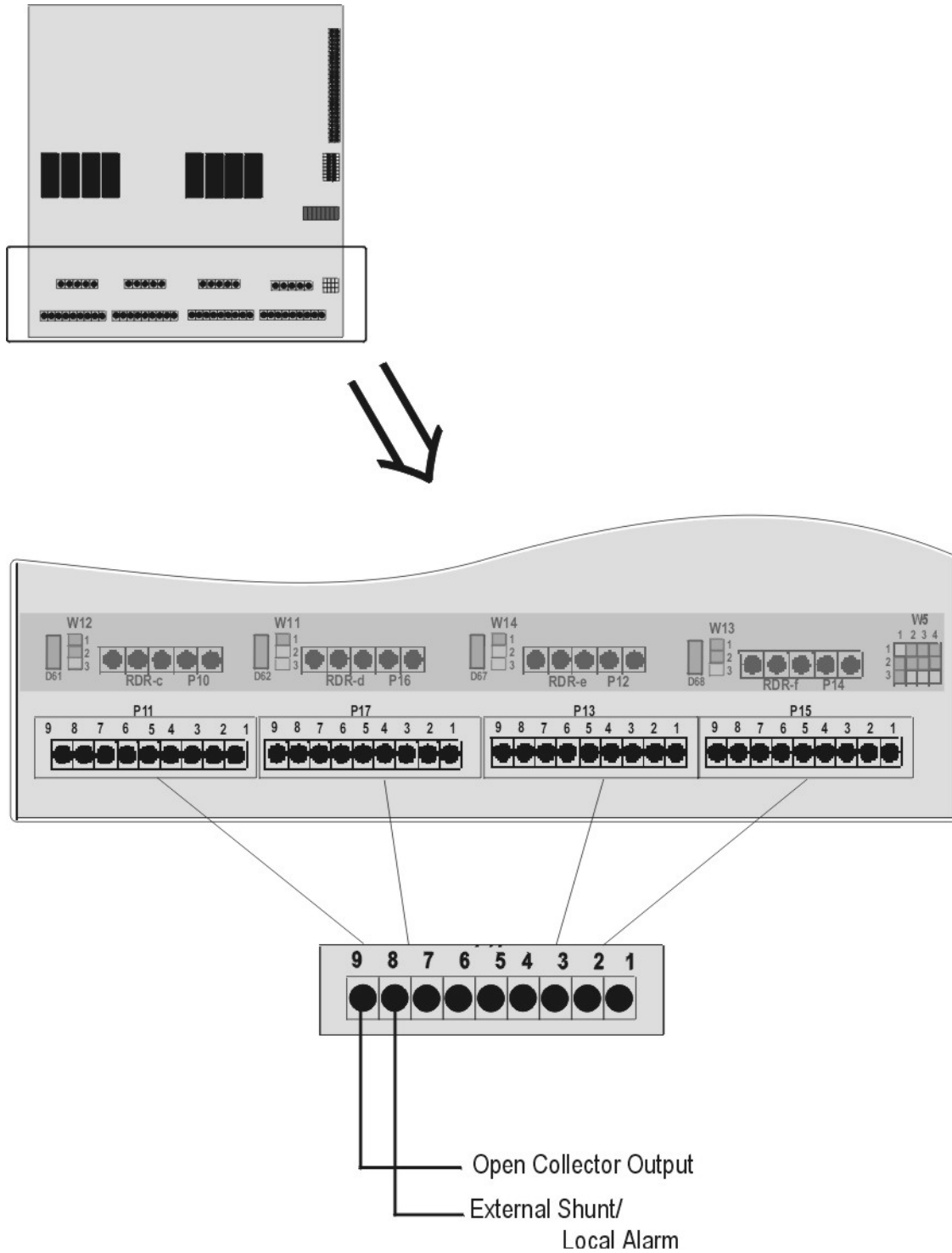
### Example of the IQ-200 to an Open Collector Output



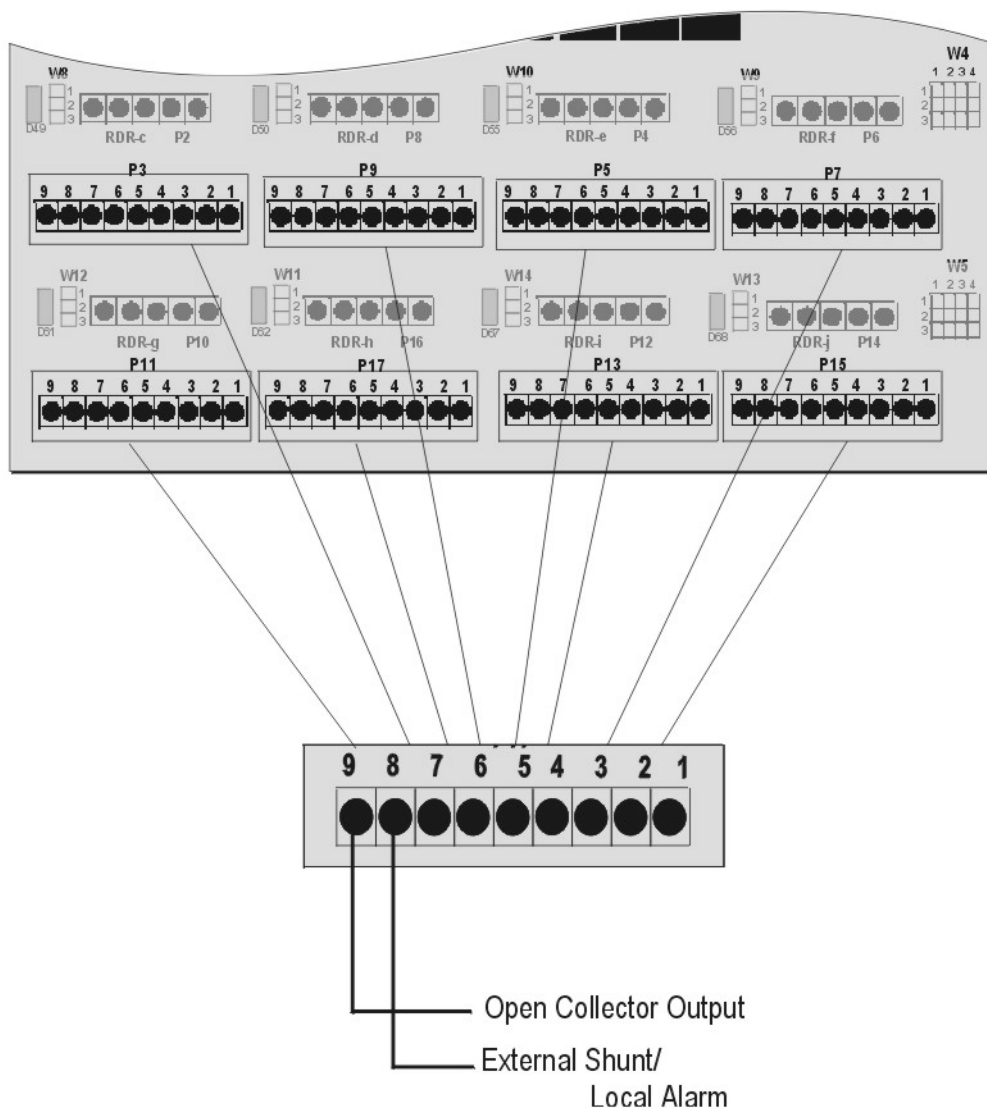
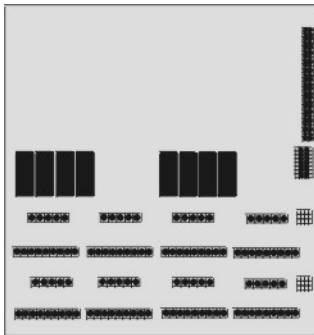
### Example of the 4/8-reader Expansion Module to an Open Collector Output



## 4-reader Expansion Module Open Collector

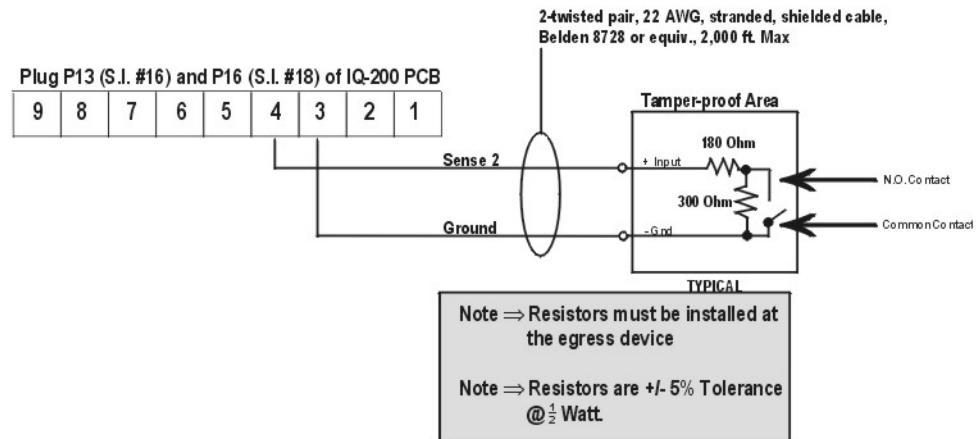


## 8-reader Expansion Module Open Collector

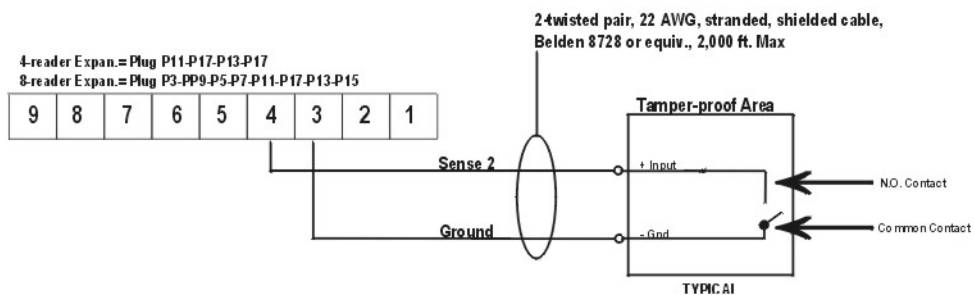


## Egress Sense for IQ-200 and 4 and 8-reader Expansion Module

### Supervised Egress Sense for the IQ-200

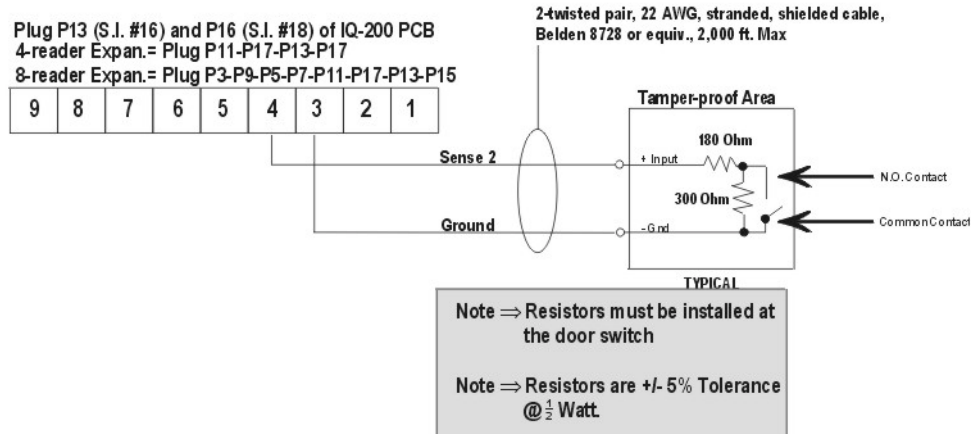


### Unsupervised Egress Sense for the 4/8 Reader Expansion Module



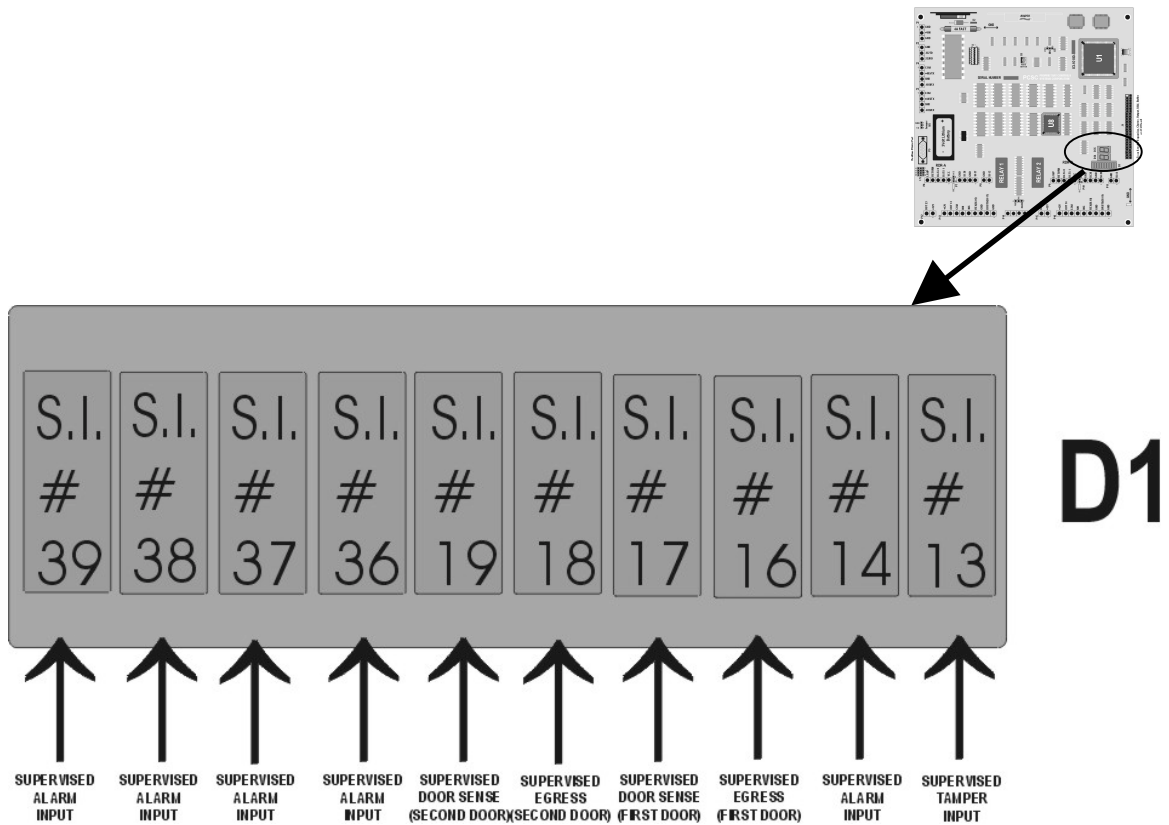
## Door Sense for IQ-200 and 4 and 8-reader Expansion Module

### Supervised Door Sense



## Using the Ten-Segment LED Array

Two LED's, located in the ten-segment array D1, indicate the status of the supervised door circuits. Also the supervised tamper, supervised egress inputs, and supervised alarm inputs are annunciated in the LED array as listed below:

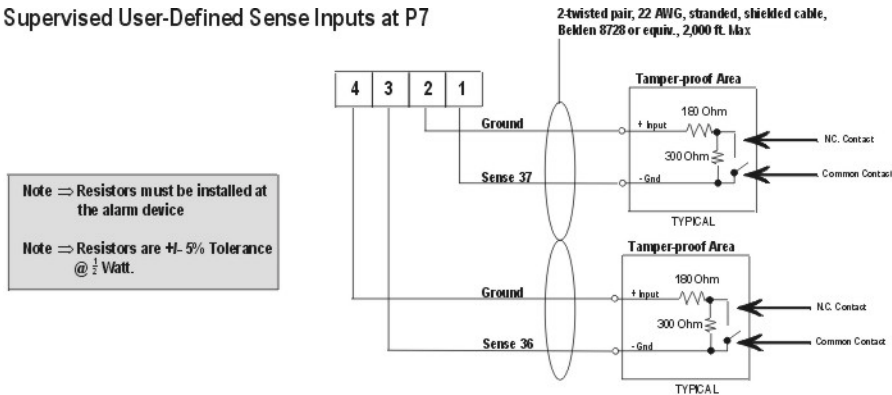


### LED Status Chart For All IQ-200 Sense Inputs

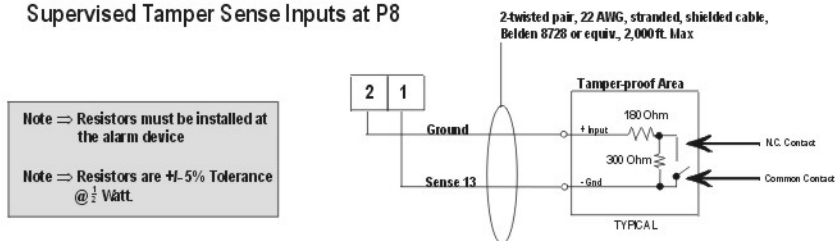
OFF	Circuit is normal/secure
ON	Circuit is in an alarm condition
0.5 MHz blink	Fault condition. Open circuit
1 Hz blink	Fault condition. Short circuit.
4 Hz blink	Circuit is NOT calibrated & NOT functional.

## Supervised Sense Inputs for P7, P8, P10 and P11

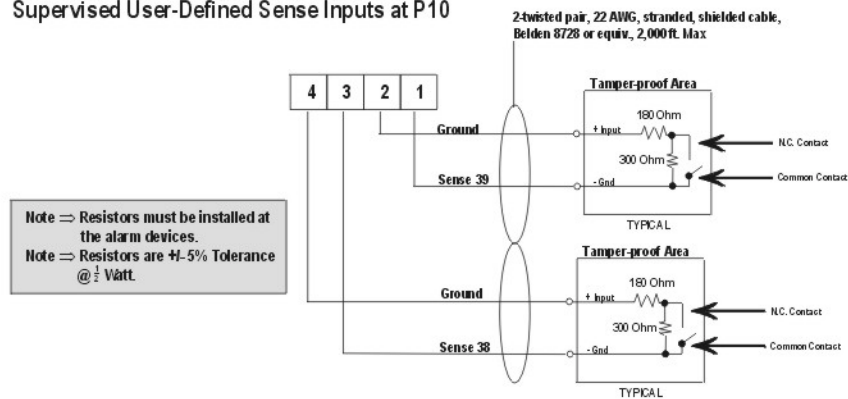
### Supervised User-Defined Sense Inputs at P7



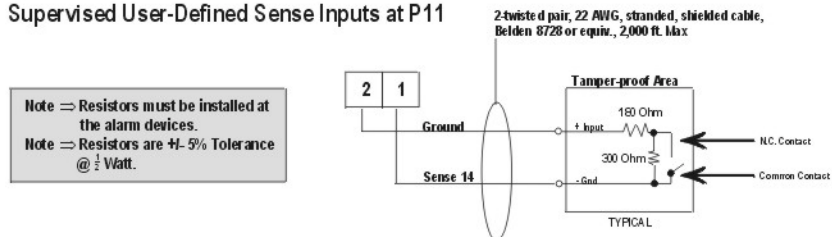
### Supervised Tamper Sense Inputs at P8



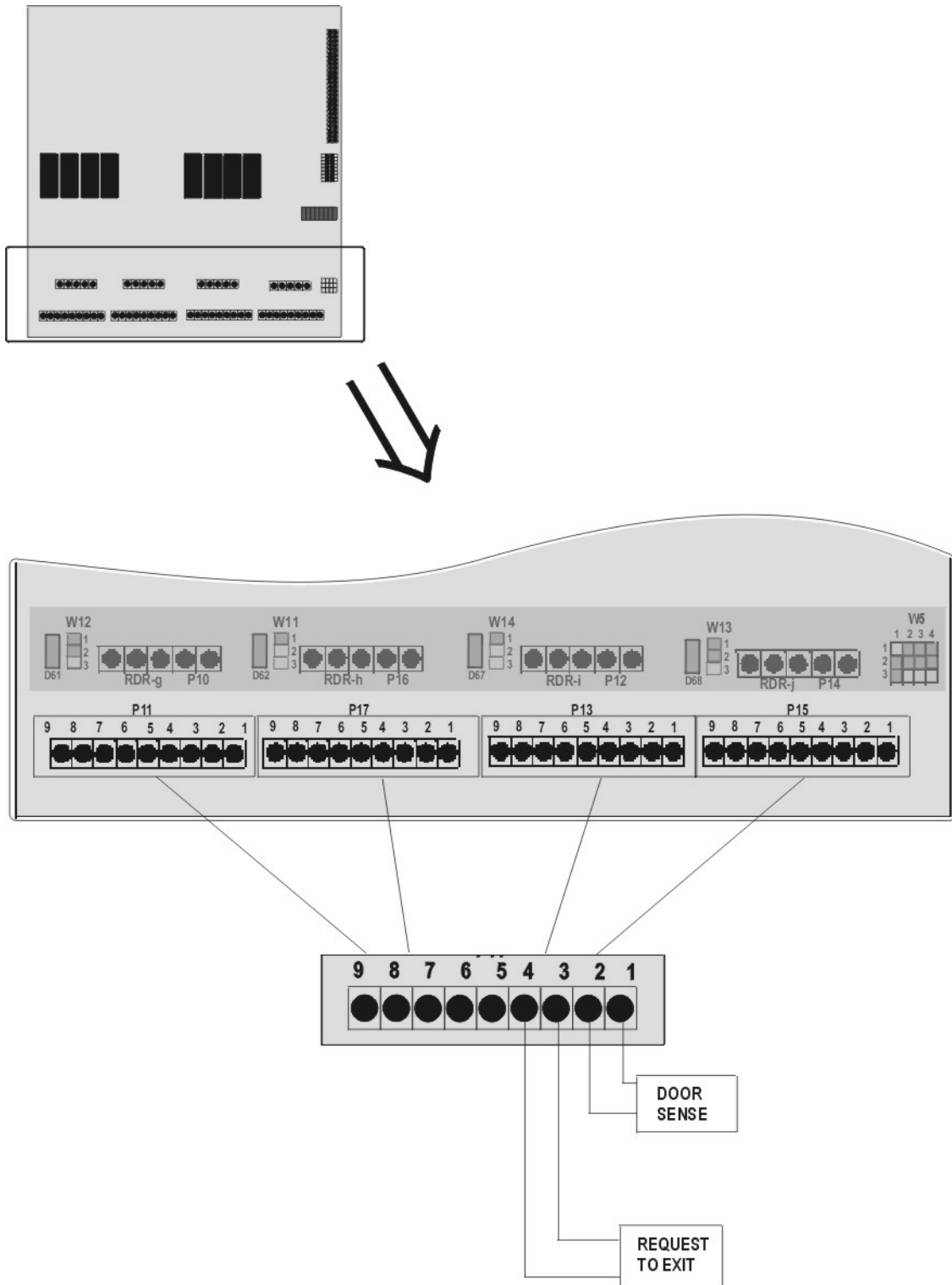
### Supervised User-Defined Sense Inputs at P10



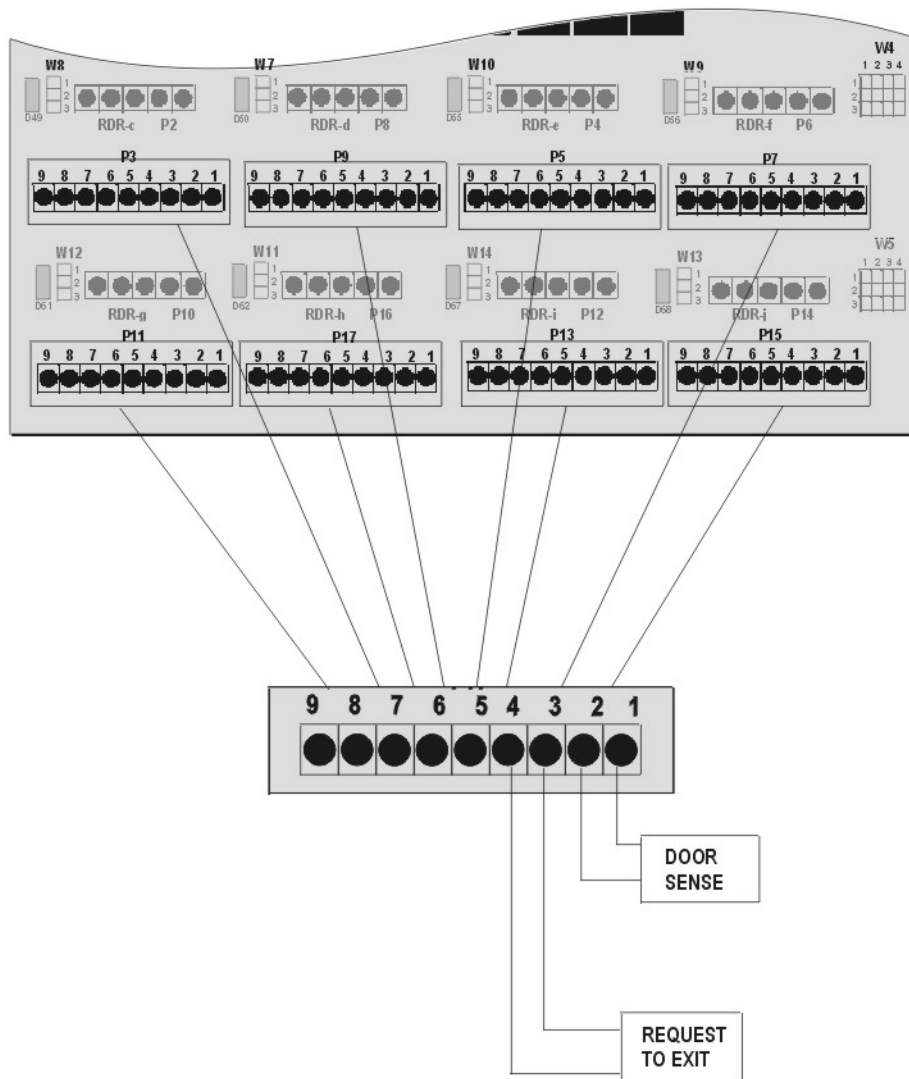
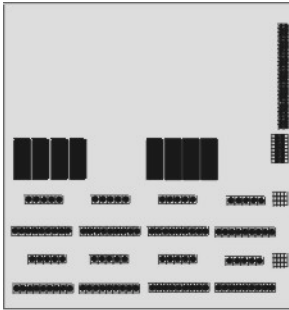
### Supervised User-Defined Sense Inputs at P11



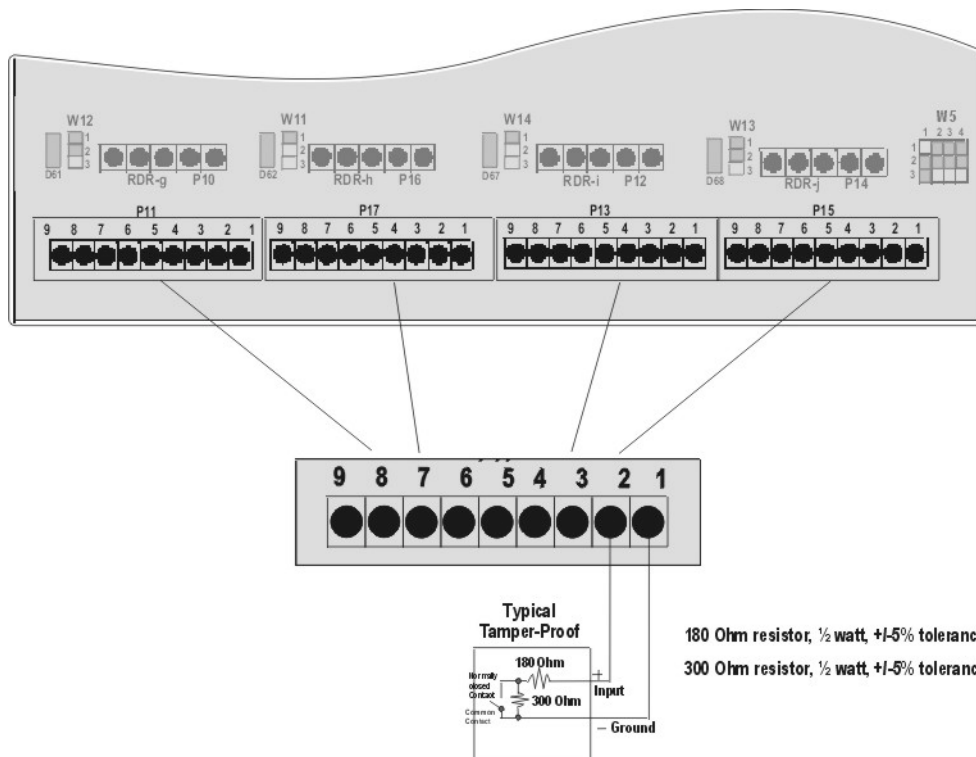
## 4-reader Expansion Module Supervised Door Senses and Unsupervised Request-to-Exit Sense Inputs



## 8-reader Expansion Module Supervised Door Senses and Unsupervised Request-to-Exit Sense Inputs



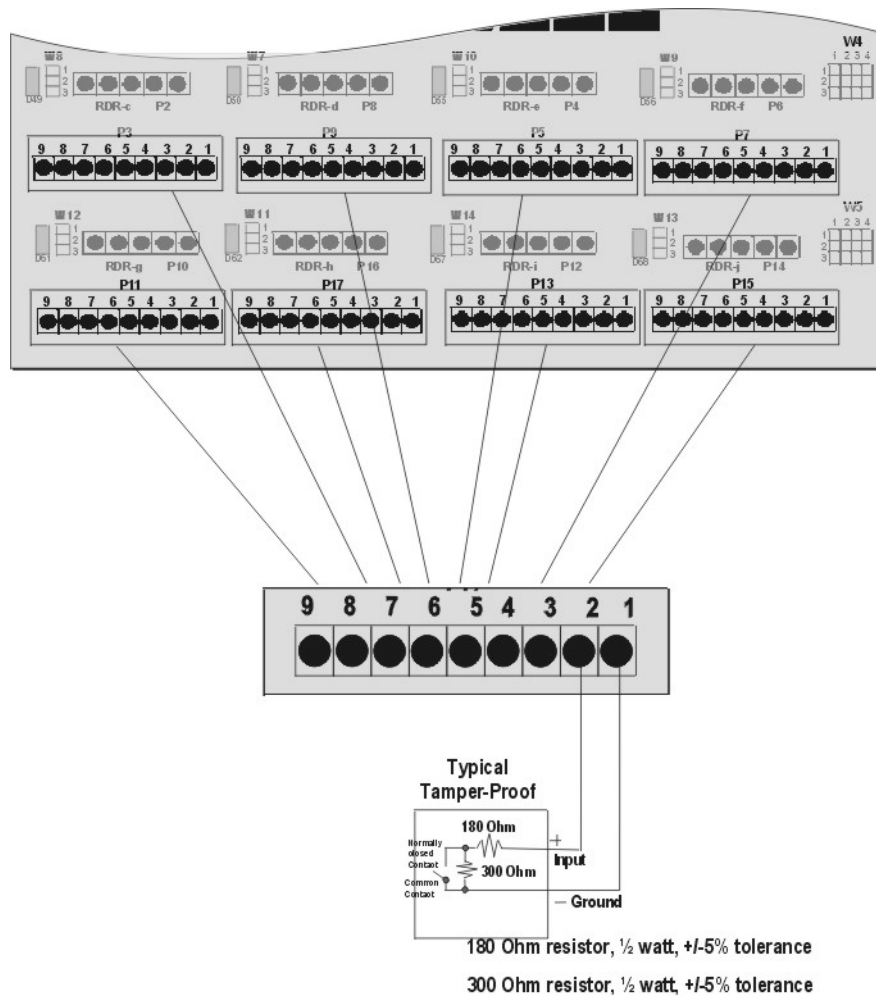
## 4-reader Expansion Module Supervised Door Sense Locations



Install End-of-Line resistors at door switch/express device (not at the IQ panel end of the cable).

When door is closed, continuity exists across the common (COM) and normally closed (N.C.) door switch contacts.

## 8-reader Expansion Module Supervised Door Sense Locations



Install End-of-Line resistors at door switch/egress device, (not at the IQ panel end of the cable).

When door is closed, continuity exists across the common (COM) and normally closed (N.C.) door switch contacts.

## Installing Noise Suppression Devices

To install either an MOV or diode (or both) to suppress noise and avoid problems related to spikes, follow the instructions below and refer to the diagrams on the following pages.

### Procedure:

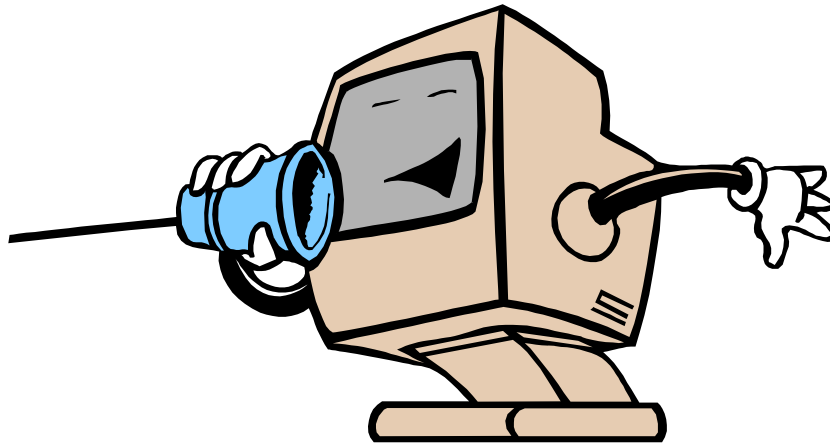
The most effective location for a suppression device is at the source; in this case, at the door strike.

1. Remove the strike-locking device and find the wire connector that attaches the lock wires to the lock.
2. Install an MOV (Siemens S10K30 or Equivalent) in parallel with the load. The MOV is a non-polarized device and will work with both AC and DC locks. For further protection on DC units, a reverse biased diode may be installed (we suggest types 1N4004 to 1N4007 be used) also in parallel with the load.

**NOTE** Use an additional MOV if you experience further noise at the strike.

3. Note the wiring set-up of your particular system. Connections can be made either to the “normally open” (fail secure) contact or to the “normally-closed” (fail-safe) configuration whereby an isolation relay is used and a diode (or MOV) is added for noise suppression.

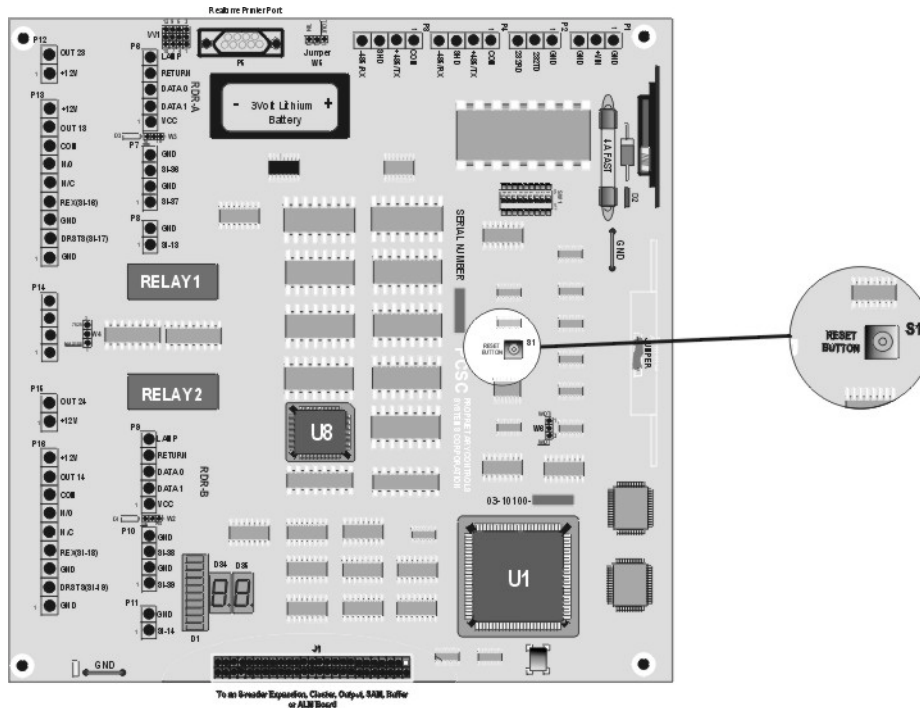
## Step 5-Communicating with the IQ-200



## Communicating with the IQ-200

### Addressing Individual IQs through the DIP Switch

The IQ-200 can communicate over a dialup MODEM, an RS232 or an RS485 serial direct connection. In a multidrop IQ-200 configuration, the IQ-200 MUST communicate via RS-485 protocol.



1. You may elect to install the supervisory resistors at this time or optionally wait until after on-line communications has been established to the LiNC-NET Host PC. Set DIP switches 1-7 (located at SW1) to **OFF** position as it is etched on the IQ-200 PCB. Hit the reset switch at S1. This will calibrate all ten of the supervised inputs on the IQ-200PCB and the supervised Door Sense's on the 4/8-Door Cluster PCB's. SAM sense inputs are calibrated only by toggling switch #3 of SW-1 on each SAM PCB.

**NOTE** You must have ALL supervised switches in place for calibration. The supervised lines must be calibrated in order for the supervised inputs to work. If not, the sense inputs will be in a constant fault when the calibration is performed.

2. Set the IQ-200 ID number using the DIP switches at SW1. See DIP switching the IQ-200 below. After setting the DIP switches accordingly, push the S1 Reset Button. Addressing the panel does NOT affect the data stored in its memory nor does it affect the calibration of the sense inputs.
3. Establish communication for LiNC-NET (for 3.11/95/98 or NT).

4. Once all parameters and configurations are defined in LiNC-NET, download all files to IQ-200 and logoff LiNC-NET. This will cause a system **Restart** to occur on the IQ-200. The seven segment LEDs will show an **86** indicating the **Restart** taking place.
5. **(Optional Step)** To manually calibrate all supervised sense inputs on the IQ series panel(s), place switches 1 through 7 to the **ON** position (as it is etched on the IQ-200 PCB) and push the reset switch at S1. Calibration of the sense inputs does not affect the data stored in memory nor does it affect the panels addressing.

<b>NOTE</b>	<b>Manual calibration of all sense inputs on the IQ-200 PCB and the 4/8 Door Cluster PCB is accomplished by this step. However, the sense inputs on the SAM PCB's <u>must</u> be done by toggling switch #3 of SW-1 on <u>each</u> SAM board.</b>
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6. The IQ-200 is ready for operation.
7. The ID number on the IQ-200 should always remain set. In case of a power loss, the unit will read the switch for ID. Should the panel's ID number need to be changed the switches of SW1 should be set to reflect the new number and then the S1 Reset button should be pushed. This process will NOT erase any data from the IQ-200 nor will it affect the calibration of the sense inputs.

## DIP Switching the IQ-200 Address (1-111)

The DIPswitch is located at SW1, to the left of the center of the board. There are 8 switches. For the binary number of 1, flip the switch to the left. For zero (0), flip the switch to the right.

SW1		Example: IQ #1		SW1		Example: IQ #23	
On	Off	Switch#	Switch# in Binary	On	Off	Switch#	Switch# in Binary
1	<input type="checkbox"/>	1	1	1	<input checked="" type="checkbox"/>	1	1
2	<input type="checkbox"/>	2	0	2	<input checked="" type="checkbox"/>	2	1
3	<input type="checkbox"/>	3	0	3	<input checked="" type="checkbox"/>	3	1
4	<input type="checkbox"/>	4	0	4	<input checked="" type="checkbox"/>	4	0
5	<input type="checkbox"/>	5	0	5	<input checked="" type="checkbox"/>	5	1
6	<input type="checkbox"/>	6	0	6	<input checked="" type="checkbox"/>	6	0
7	<input type="checkbox"/>	7	0	7	<input checked="" type="checkbox"/>	7	0
8	<input type="checkbox"/>	8	0	8	<input checked="" type="checkbox"/>	8	0

### NOTE

Switch #8 is used to determine if the IQ-200 communicates via either direct connect or dial-up communications. Switch #8 is only used to determine if the connection is **Direct Connect** or **AutoDial**.



The **ON/OFF** designation is in reference to the labels printed on the IQ-200 PCB. Not the switch itself!

### IQ Numbers in Decimal

SW1	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
2	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0
3	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0
4	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

### IQ Numbers in Decimal

SW1	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
2	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0
3	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0
4	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0
5	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

IQ Numbers in Decimal																								
SW1	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
2	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0
3	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0
4	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

IQ Numbers in Decimal																								
SW1	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
2	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0
3	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0
4	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0
5	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

IQ Numbers in Decimal															
SW1	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
2	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
3	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
4	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

## Setting MODEM or Direct Connect Configurations

PCSC supports the US Robotics 33.6/56K Sportster model for MODEM communication. It is recommended that the MODEM be powered up via a U.P.S.

To set up the IQ for **MODEM** communication, configure the DIPswitch settings at SW1, as follows:

### **Example: MODEM connection (IQ-200, panel address is #1)**

SW1

On 1 Off 0

1	<input type="checkbox"/>	Set # 1 to ON (left), 2 through 7 to OFF (right). Set # 8 to ON (left).	Set the configuration and press the Reset button at S1. After the sequence of LEDs displays, set the IQ-200 ID number (see DIP Switching the IQ-200 Number). On the back of the <b>US Robotics modem</b> , locate the DIP switch. Set 1, 5 and 6 in the <b>Up</b> position and 2, 3, 4, 7 and 8 in the <b>Down</b> position.
2	<input type="checkbox"/>		
3	<input type="checkbox"/>		
4	<input type="checkbox"/>		
5	<input type="checkbox"/>		
6	<input type="checkbox"/>		
7	<input type="checkbox"/>		
8	<input type="checkbox"/>		

**NOTE** AT SW1, switch #8 must remain in the ON position (left) for **MODEM** communication.

To set up the IQ for **direct connect** communication (default), configure the DIP switch settings at SW1, as follows:

### **Example: Direct connection (IQ-200, Panel address is #1)**

SW1

On 1 Off 0

1	<input type="checkbox"/>	Set # 1 to ON (left), 2 through 8 to OFF (right).	Set the configuration and press the Reset button at S1. After the reset, set the IQ-200 ID number (see DIP Switching the IQ-200 Number).
2	<input type="checkbox"/>		
3	<input type="checkbox"/>		
4	<input type="checkbox"/>		
5	<input type="checkbox"/>		
6	<input type="checkbox"/>		
7	<input type="checkbox"/>		
8	<input type="checkbox"/>		

**NOTE** AT SW1, switch #8 must remain in the OFF position (right) for **Direct Connect** communication.

To communicate from an IQ-200 to the MODEM, two cables must be fabricated: one from the MODEM to the IQ and another for the PC host to the MODEM. See the diagrams under Cable Requirements.



The **ON/OFF** designation is in reference to the labels printed on the IQ-200 PCB. Not the switch itself!

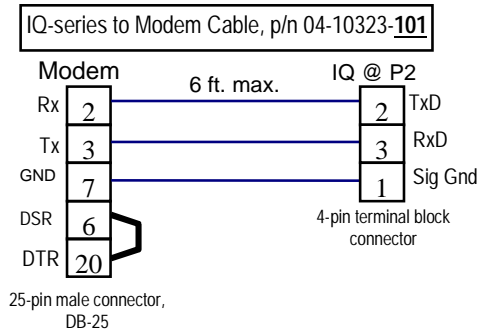
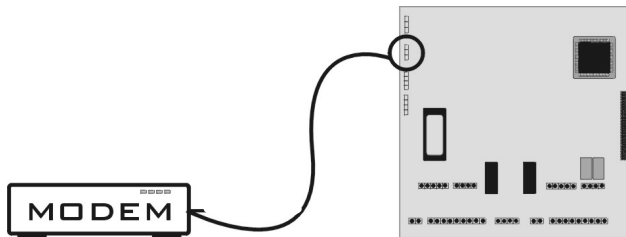
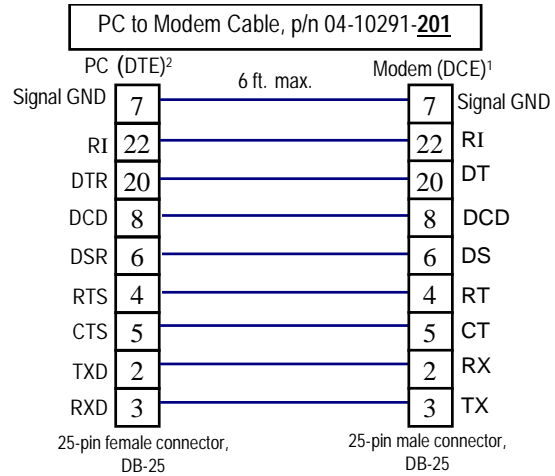
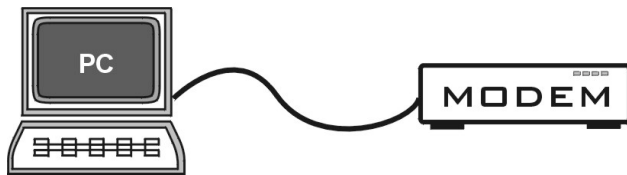
## Ensuring Proper Configuration of the MODEM

To ensure that the MODEM retains the set configuration, the user should utilize **HyperTerminal** at the Host PC. The **HyperTerminal** program will set the configuration in the MODEM for constant uninterrupted use with the IQ-200. In the following procedure, the Init string will be written into the NOVRAM and therefore a power loss to the MODEM ONLY will not result in a continuous loop.

- Set switches 1, 5, 6, and 7 in the U.S Robotics Sportster MODEM (14.4K, 28.8, 33.6, or 56K) to **Up**. All other switches should be **Down**.
- Connect the MODEM to the PC using a standard PC to MODEM cable.
- From the PC (Win95/98/NT) access HyperTerminal by entering the following commands:
  1. Click on **Start, Programs, Accessories**, and then, **HyperTerminal**. The **Connection Description** dialog box will now appear.
  2. Type in a name for the connection (example: **MODEM TEST**). Click on a corresponding icon from the list. Click on the **OK** button.
  3. The **Connect To** dialog box will now appear. The proper communications port used to communicate to the external MODEM is now selected within the **Connect Using** field (example: **COM2**). Click on the **OK** button.
  4. The **COM# Properties** dialog box will now appear. Select **9600** in the bits per second field. Select **8** in the Data bits field, **None** in the Parity field, **1** in the Stop bits field, and **Hardware** in the Flow control field. Click on the **OK** button. The screen will now clear and the cursor will be at the top left corner of the HyperTerminal window. Type **ATV1 E1** and press Enter. The MODEM will respond with **OK**.
  5. Type **ATI3** and press Enter to display the type of MODEM connected, followed by **OK**.
  6. Type **ATI4** and press Enter to display the MODEM's current settings, followed by **OK**.
  7. Type **ATI5** and press Enter to display the MODEM's NVRAM settings, including any stored telephone numbers, followed by **OK**.
  8. Type **ATEVQHS0=1X&D0** and press Enter. The MODEM will respond by changing the **A** in the previous string to a **0** (zero).
  9. Type **AT&W0Y0** and press Enter. No visual indication will be displayed as the MODEM was configured in the previous step to use **Numeric Result Codes**.
  10. Type **ATZ** and press Enter. As in the previous step, no visual indication will be displayed.
  11. Click on **File**, then **Save**, to save the configuration file.
  12. Click on **File, Exit**, then **Yes**, to disconnect from the MODEM and exit **HyperTerminal**.
  13. Power down the MODEM and turn switch **1, 5, 6**, and **7** up. All others should be down. Connect the MODEM to the IQ-200. Perform functional testing.

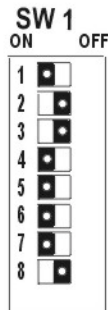
## Establishing a Proper Connection with a MODEM Cable-

To communicate from an IQ-200 to a MODEM, two cables must be fabricated: one from the MODEM to the IQ and another for the PC host to the MODEM. Cabling should be 22 AWG, 9-conductor, UL2576 and up to 6 feet in length. See the following diagrams.



## Setting the Baud Rate for Direct Connect

### Setting the Baud Rate for Direct Connect @ 9600 bps

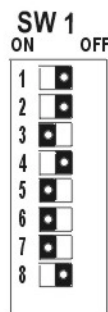


Set switches as illustrated to the left at SW-1 and then push the Reset button S1.

Then place the SW-1 in position to represent the Communications Address of the panel (see page 72).

Push the Reset button S1. Panel is now ready to communicate to the LiNC-NET host at the new baud rate.

### Setting the Baud Rate for Direct Connect @ 4800 bps

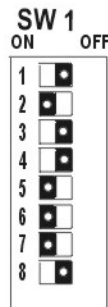


Set switches as illustrated to the left at SW-1 and then push the Reset button S1.

Then place the SW-1 in position to represent the Communications Address of the panel (see page 72).

Push the Reset button S1. Panel is now ready to communicate to the LiNC-NET host at the new baud rate.

### Setting the Baud Rate for Direct Connect @ 2400 bps

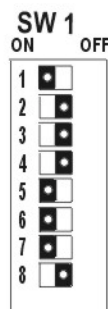


Set switches as illustrated to the left at SW-1 and then push the Reset button S1.

Then place the SW-1 in position to represent the Communications Address of the panel (see page 72).

Push the Reset button S1. Panel is now ready to communicate to the LiNC-NET host at the new baud rate.

### Setting the Baud Rate for Direct Connect @ 1200 bps



Set switches as illustrated to the left at SW-1 and then push the Reset button S1.

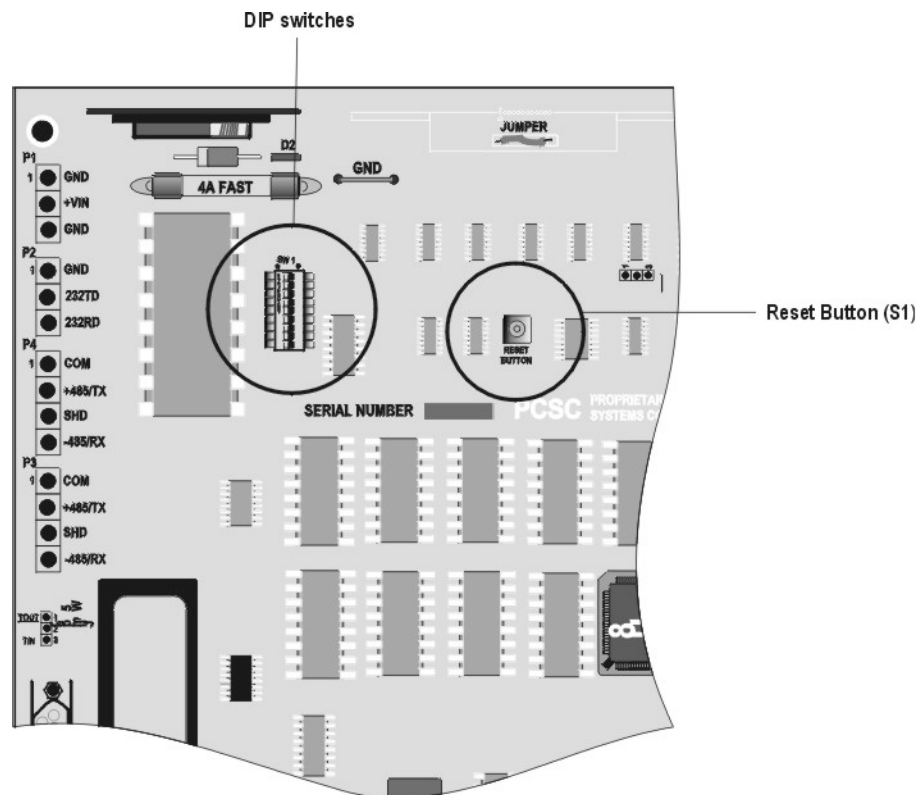
Then place the SW-1 in position to represent the Communications Address of the panel (see page 72).

Push the Reset button S1. Panel is now ready to communicate to the LiNC-NET host at the new baud rate.

## Changing the Baud Rate

1. Request the IQ Off-line in Define MicroLPM status screen in the LiNC-NET software.
2. Change the Baud rate in the Host computer Setup menu in the LiNC-NET Software.
3. Log off and back on to the system.
4. Set the switch (SW1) setting for the Baud rate and press the S1 Reset button (Refer to the previous section) on page 76.
5. Change the SW1 switch setting back to the IQ-200 number. See section on DIP switching the IQ number on page 77.
6. Request the IQ back on-line in the Define Micro-LPM status screen in the LiNC-NET software.

**NOTE** Presently the IQ-200 only supports communication at 9600 BPS.



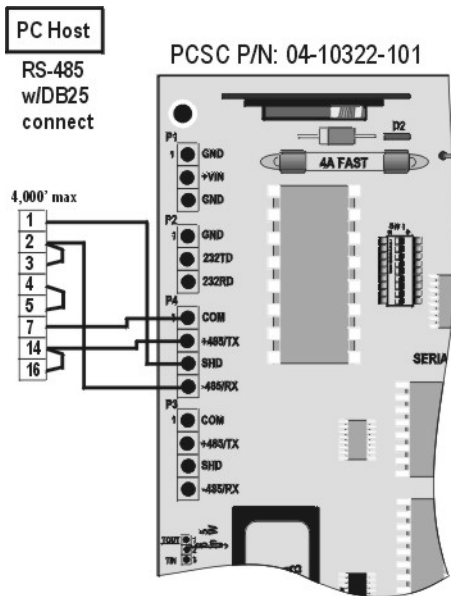
**SW1 DIPSwitch & S1 Reset button location**

## Direct Connecting with One IQ

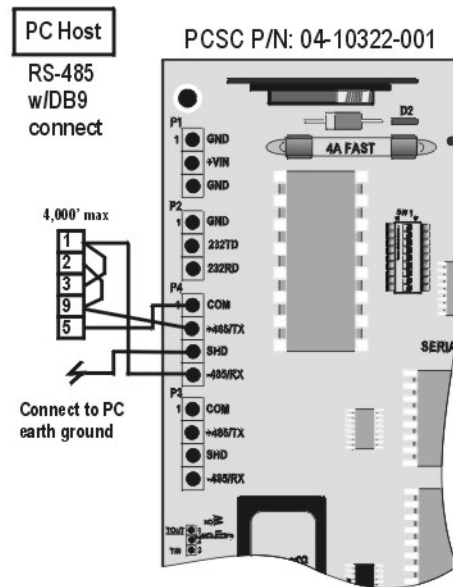
The PC Host is connected to the IQ-200 by means of a cable designed for either RS-485 or RS-232 communication. The following diagrams illustrate the RS-485 and RS-232 DB9 or DB25 connectors options available.

### Wiring Diagram- IQ-200 to PC, RS-485 Connector

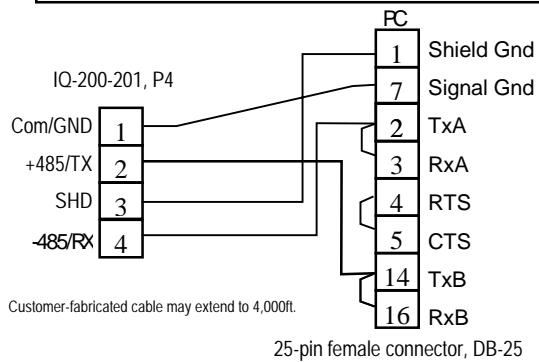
#### w/ DB25 connector



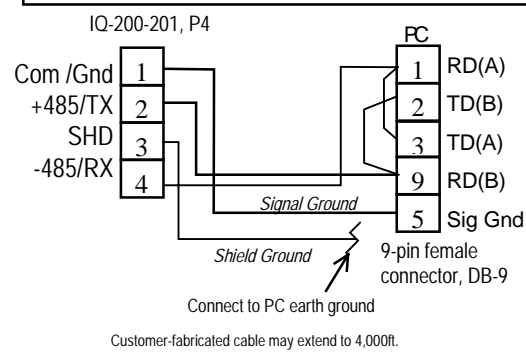
#### w/ DB9 connector



IQ-200 to PC, RS-485 w/ DB25 Connector, Optically Isolated, PCSC P/N 04-10322-101



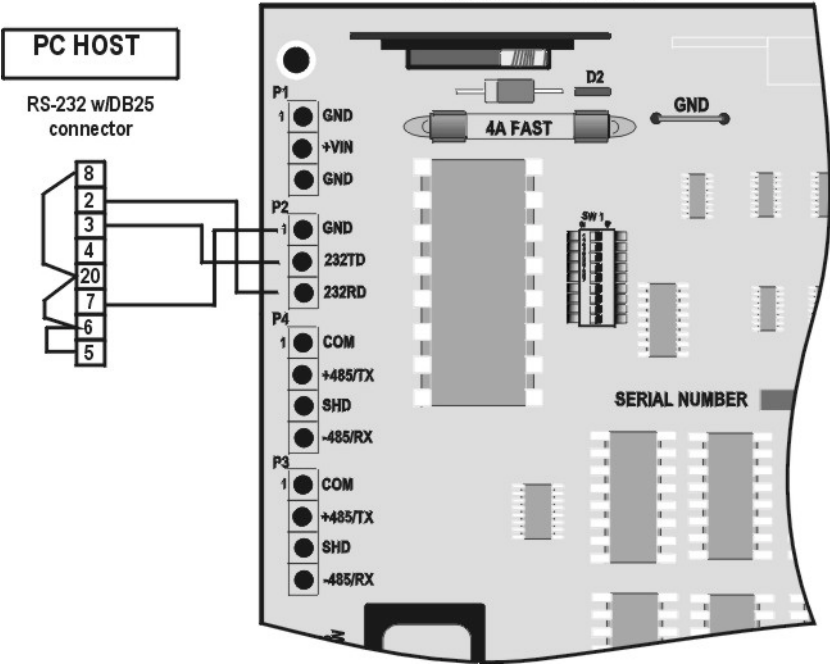
IQ-200 to PC, RS-485 w/ DB9 Connector, Optically Isolated, PCSC P/N 04-10322-001



Wiring Diagram- IQ-200 to PC, RS-232 w/DB25 connector

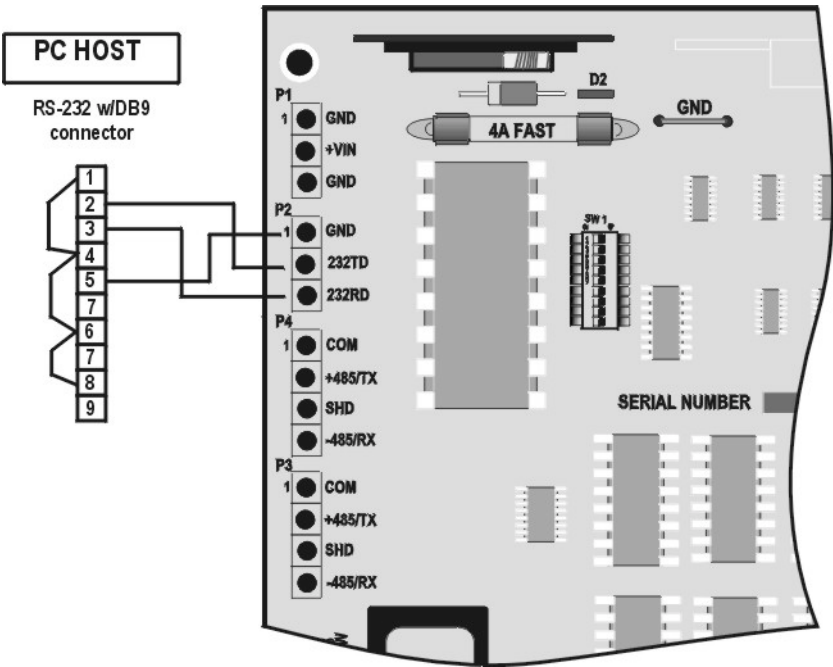
PCSC P/N: 04-10318-101

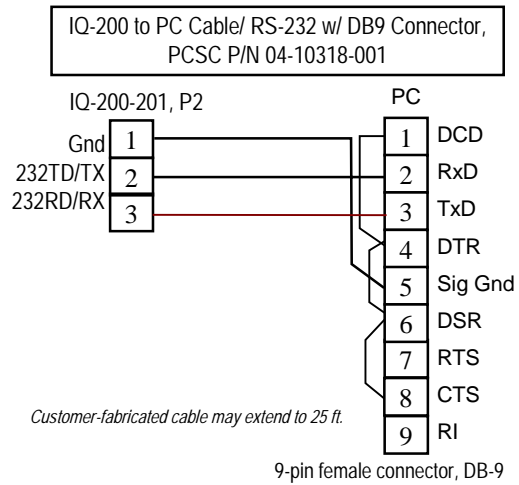
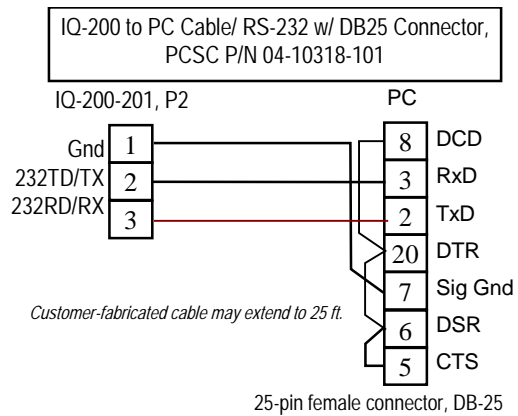
PCSC P/N: 04-10318-101



Wiring Diagram- IQ-200 to PC, RS-232 w/ DB9 Connector

PCSC P/N: 04-10318-001

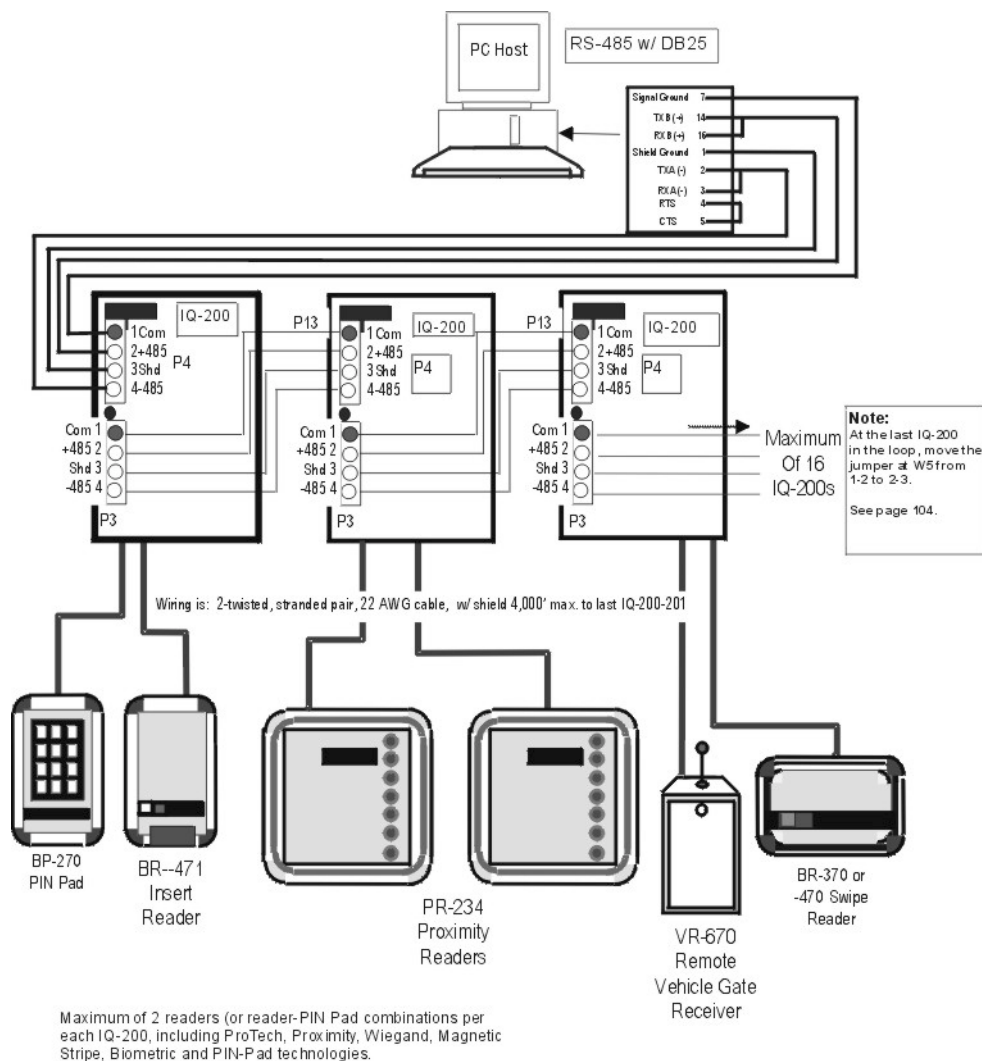




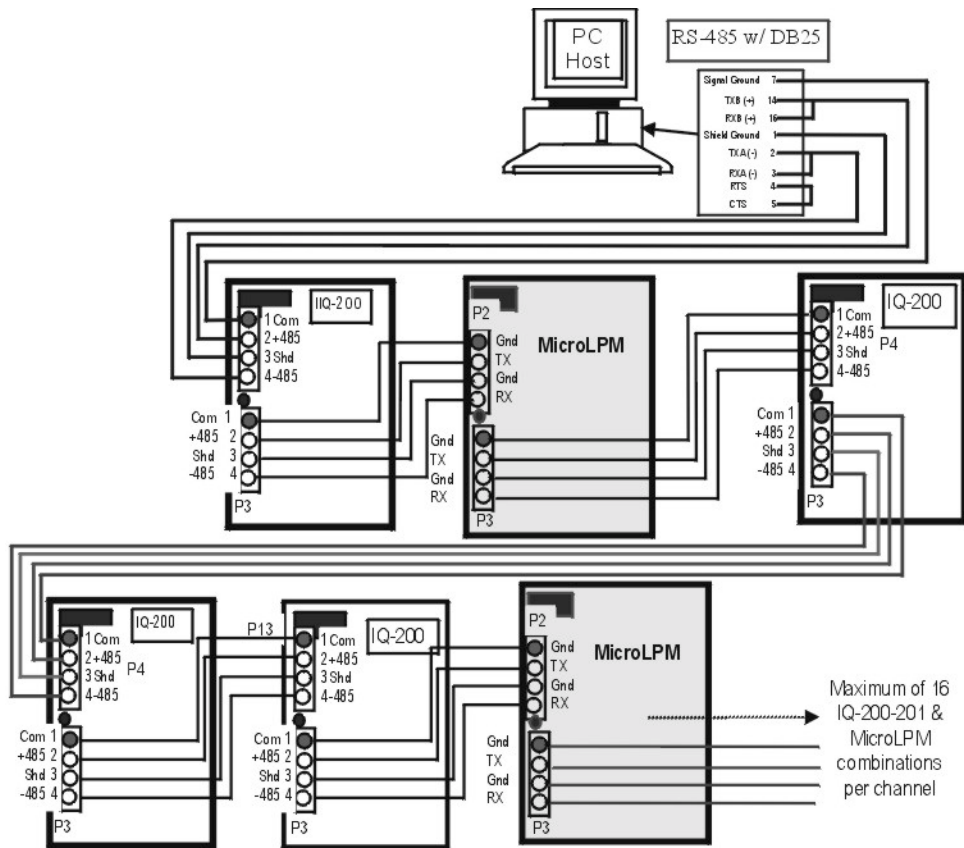
## Communicating with Multiple IQs (via RS-485)

Once the PC host is connected to one IQ-200, the next IQ-200 can be connected by wiring from P3 from the first IQ to P4 in the next IQ. This format can be repeated in up to 16 IQ-200s. In addition, any combination of MicroLPMs and IQ-200s can be configured up to the 16 total limit on a single RS485 channel. LiNC-NET supports up to 4 channels (total of 64 IQ/MicroLPMs). See the next page for the IQ-200 to MicroLPM wiring connection.

### Wiring Diagram of Multiple IQ-200s



## Wiring Diagram of Multiple IQ-200s and MicroLPMs



Wiring is: 2-twisted, stranded pair, 22 AWG cable, w/ overall shield, 4,000' max.  
to last IQ-200 or MicroLPM

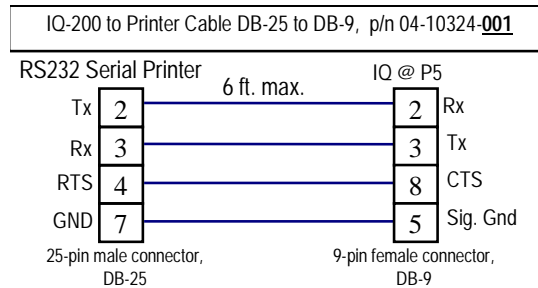
### Note:

At the last panel in the loop (if a MicroLPM), install a 120 Ohm 1/4 watt Resistor at Plug P3 between pins 2 and 4. Or (if the last panel is an IQ-200) set Jumper at W5 across pins 2 and 3.

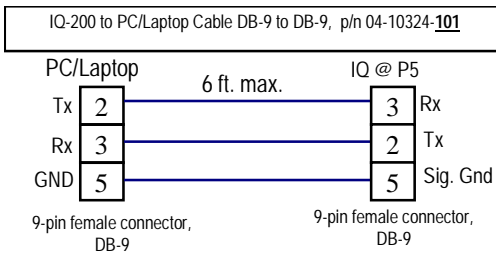
Refer to MicroLPM Installation Manual PIN: 33-10019-001 or page 104 for more information

## Real Time Serial Printing with the IQ-200

To print from an IQ-200, a cable must be fabricated: a 9-pin female connector at the IQ-end to either a 9-pin or 25-pin male connector at the printer end. Cabling should be 22 AWG, 2-twisted pair, and up to 6 feet in length. See the following diagrams. The baud rate for the printer is 9600 bits per second at the IQ-200. Connect the IQ end of the cable to P5.



## Cable configuration for capturing Real Time transactions to PC in HyperTerminal.

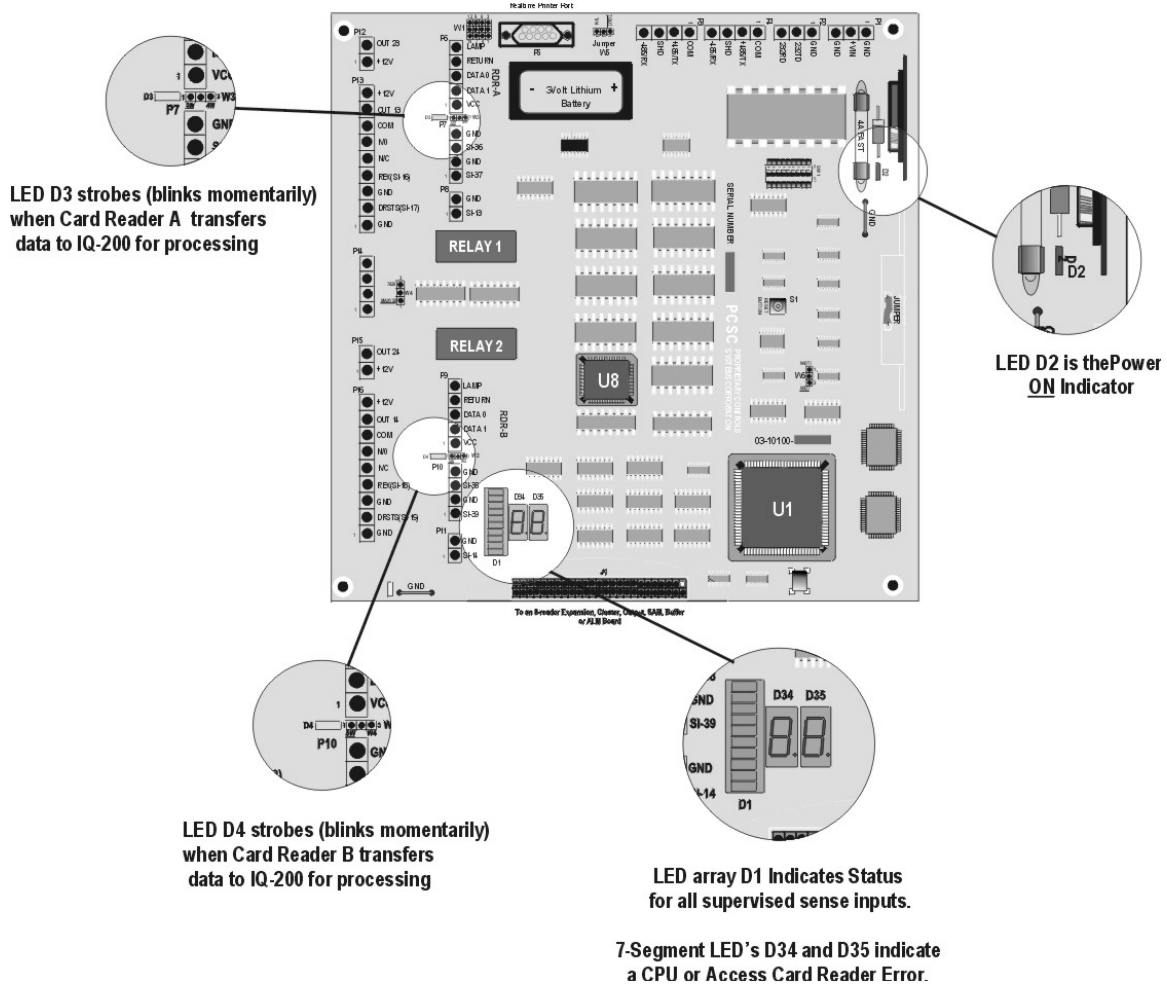


## **Step 6- Status Lights and Dealing with Communication Errors**



## Status Lights

The IQ-200 circuit board has 15 LEDs. The status of the LED defines a certain activity or phase of IQ-200 functions. Card processing and door sense status is indicated by the LEDs.



## Communication Errors

Message at the PC	What to Do
IQ-200 is not responsive	Verify the following: <ol style="list-style-type: none"><li>1. The red DC Power Indicator LED (D2) is ON.</li><li>2. Verify that the ID number corresponds to the IQ-200 at the PC. (Check settings of switches at SW1).</li><li>3. Check cabling. (RS232/MODEM/RS485/Terminal Server).</li></ol>

### **LED Fatal Error Display Codes (Please CALL your PCSC representative)**

E1	ROM error detected- Probable PCB failure.
E2	RAM error detected- Probable PCB failure. Verify that the IC at <u>U8</u> is seated properly.
E4	Packet addressing error- IQ-200 failure
E5	Packet queuing error- IQ-200 failure.
E7	Terminal number configuration error- Readdress IQ-200
ED	Database invalid- <b>RESET</b> and configure IQ address
EE	Stray jump- Probable IQ-200 PCB failure.
EF	Execution of int vector- Probable IQ-200 PCB failure.

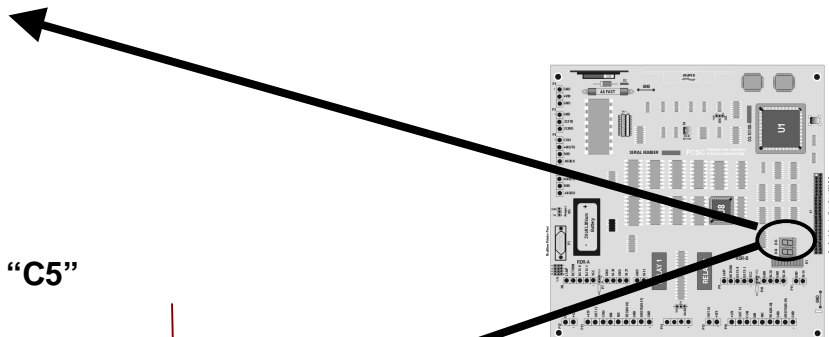
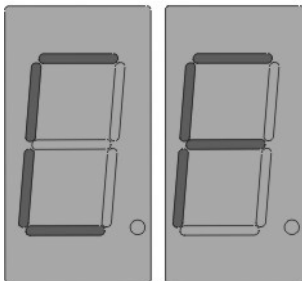
## Error Codes

The seven-segment LEDs, D34 and D35, will indicate certain errors that can occur when processing cards. They also can communicate “fatal” errors that could occur. The following chart describes different error codes that are displayed by the seven-segment LEDs:

<u>D Warning Error</u>	<u>Display Codes</u>	<u>Possible Problem</u>	<u>What to Do</u>
C0 Card Error:	Parity check fail	Bad Card or dirty reader head	Clean reader head & re-try
C1 Card Error:	LRC check failed	Bad Card or dirty reader head	Clean reader head & re-try
C5 Card Error:	data length mismatch	Check for correct format type	Verify that the correct reader technology is specified
CC Card Error:	data conversion	Check for correct format type	Verify that the correct reader technology is specified
CE Card Error:	end-code not found	Bad card or dirty reader head	Clean reader head & re-try
CF Card Error:	facility code	The site code is invalid for this site	Load correct facility code or check cards
EC Hardware	Configuration error	The IQ is not configured correctly	In LiNC-NET for Windows, select the MicroLPM Setup icon and the Hardware file-tab to verify that the extension adapters are selected for this IQ.

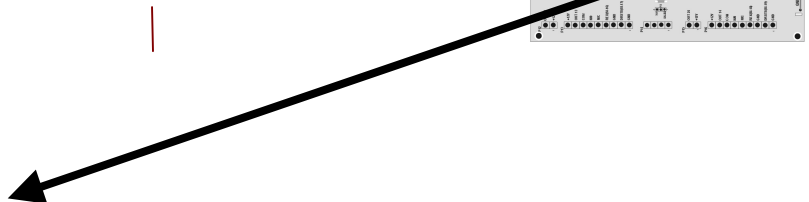
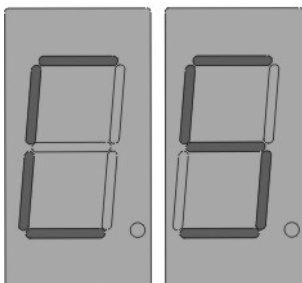
### Example #1: Error Code “CF”

**D34 D35**



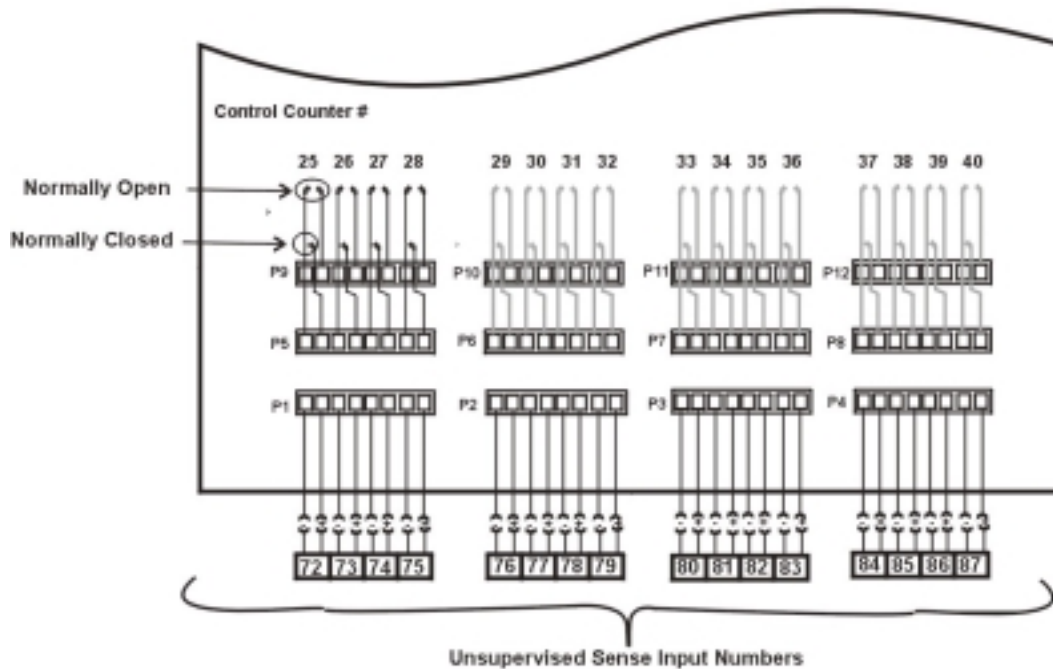
### Example #2: Error Code “C5”

**D34 D35**

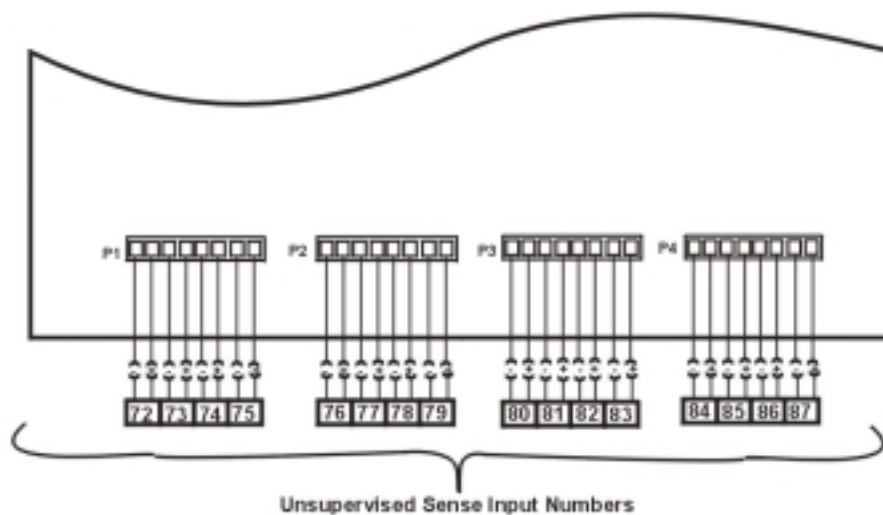


## Control Counters & Sense Input Numbers for Output Control PCB

### Output Control PCB P/N 03-10032-004

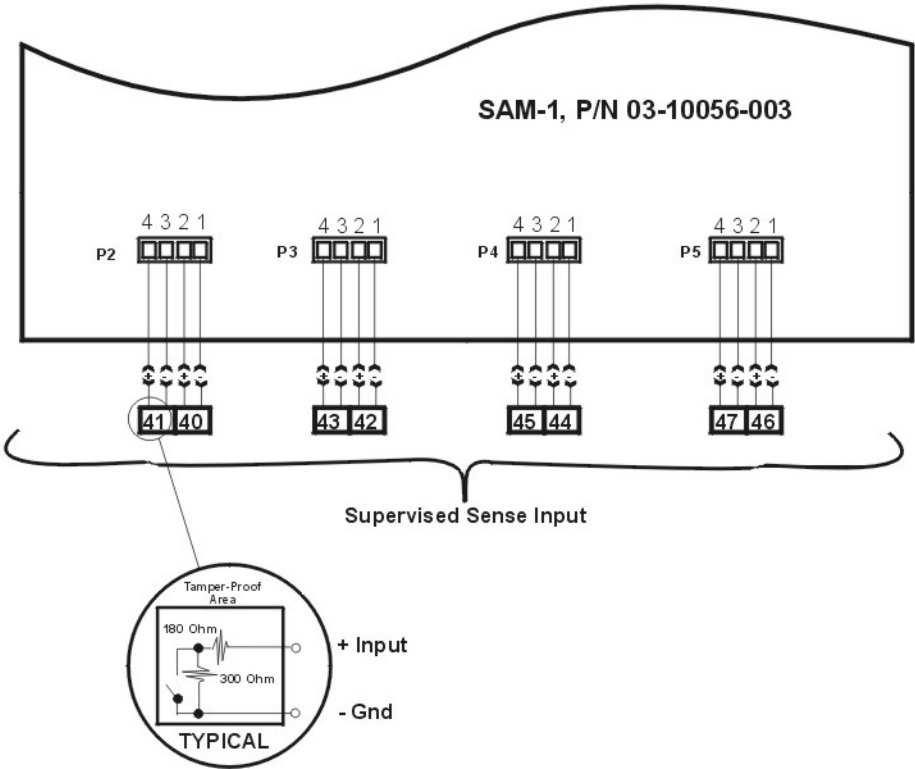


### ALM (ALarm Monitor) PCB P/N 03-10032-101



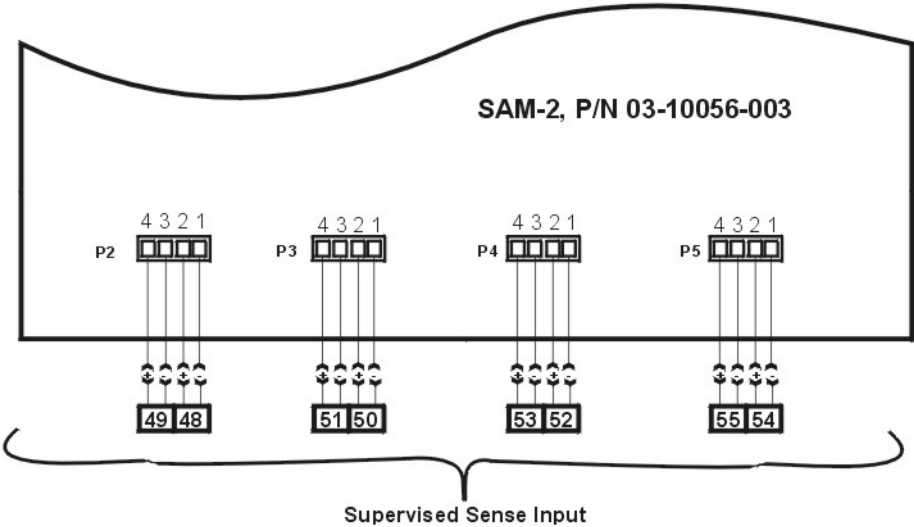
**NOTE** Addressing of the Output/ALM PCB is done via switch SW-1. All eight switches should be in the OFF (0) position.

Sense Input Numbers on the Supervised Alarm Module (SAM-1)



**NOTE** SAM 1 and 2 PCBs are calibrated by toggling switch #3 at SW-1 on each SAM PCB.

Sense Input Numbers on the Supervised Alarm Module (SAM-2)



## IQ System Upgrades and Capacities

Models	Reader	Door Strike Relay Outputs	Aux. Output Relay Drivers	Aux. Output Relays	Super-vised Door Contact Inputs	Super-vised REX Inputs	Super-vised Aux. Inputs	Unsuper-vised Aux. Inputs	Super-vised Tamper Alarm Sense Inputs	Super-vised Reader Detect	Unsuper-vised REX Inputs
<b>IQ-200</b>	2	2	4	0	2	2	5	0	1	2	0
<b>IQ-400</b>	4	4	8	0	4	4	10	0	2	4	0
<b>IQ-600</b>	6	6	8	0	6	2	5	0	1	6	4
<b>IQ-1000</b>	10	10	12	0	10	2	5	0	1	10	8
<b>IQ-/OUT</b>	2	2	4	16	2	2	5	16	1	2	0
<b>IQ-600/OUT</b>	6	6	8	16	6	2	5	16	1	6	4
<b>IQ-1000/OUT</b>	10	10	12	16	10	2	5	16	1	10	8
<b>IQ/ALM</b>	2	2	4	0	2	2	5	16	1	2	0
<b>IQ-600/ALM</b>	6	6	8	0	6	2	5	16	1	6	4
<b>IQ-1000/ALM</b>	10	10	12	0	10	2	5	16	1	10	8
<b>IQ/SAM</b>	2	2	4	0	2	2	13	0	1	2	0
<b>IQ/SAM2</b>	2	2	4	0	2	2	21	0	1	2	0
<b>IQ-600/SAM</b>	6	6	8	0	6	2	13	0	1	6	4
<b>IQ-600/SAM2</b>	6	6	8	0	6	2	21	0	1	6	4
<b>IQ-1000/SAM</b>	10	10	12	0	10	2	13	0	1	10	8
<b>IQ-1000/SAM2</b>	10	10	12	0	10	2	21	0	1	10	8
	Readers	*Form C Dry Contact	Open Collector or Transistor (+12 VDC @ 100 mA max.) Output	*Form C Dry Contact	Super-vised Door Sense Inputs	Super-vised Egress Inputs	Super-vised General Purpose Alarm Points	Unsuper-vised General Purpose Alarm Points	Super-vised Tamper Inputs	Super-vised reader detect	Unsuper-vised Egress Inputs

\*Form C Dry Contact- Relay comprised of normally open (N.O.), normally closed (N.C.) and Common (Com) contacts which are available for connection. Contacts are rated at 2 Amps, 12/24 VDC continuous power.

## Special Firmware Notes

### 8-reader Expansion Board

Addressing 8-reader Expansion Board:

1. At SW1 DIPSwitch, set all switches to the left.
2. For Address 1 = Move switch #1 only, to the right (see page 13).
3. For address 2 = Move switch #2 only, to the right (see page 13).

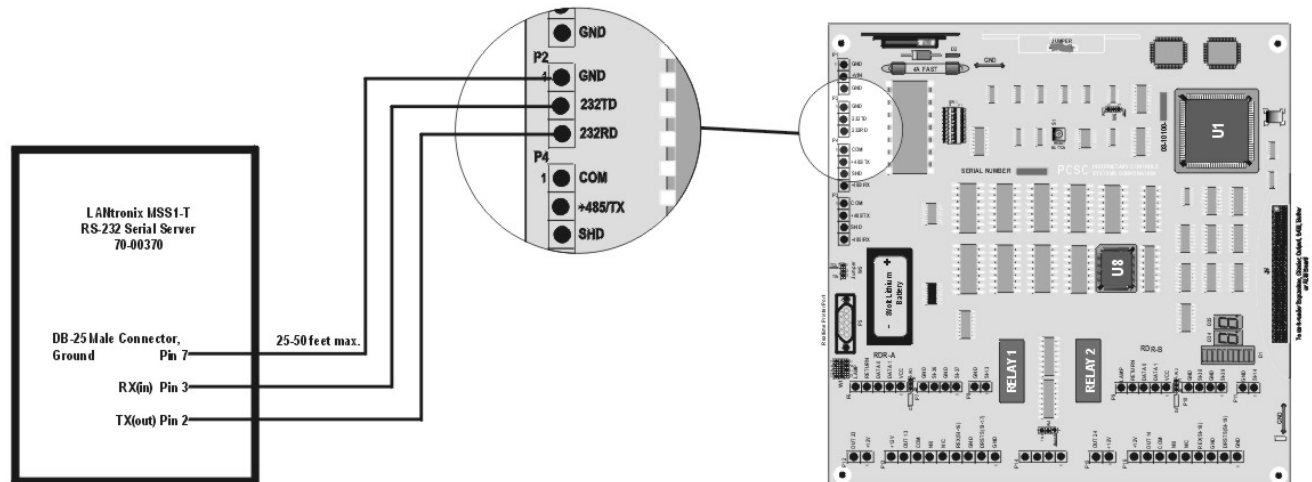
<b>NOTE</b>	This version does <u>not</u> support a second 8-reader Expansion Board, at this time. 4-Reader Expansion Board: <ol style="list-style-type: none"><li>1. At SW-1 DIP-Switch, set all switches to the left.</li><li>2. Move switch #2 <u>only</u> to the right (see page 12)</li></ol>
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### Readers

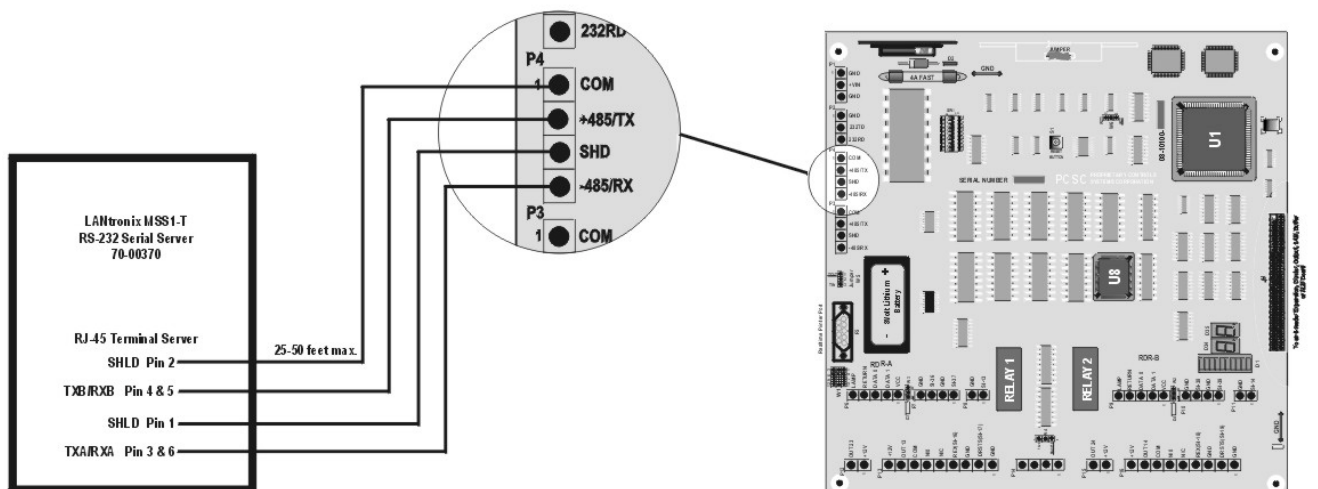
The IQ-200 supports both 4 & 5-wire readers. All other reader expansion boards (4/8-door clusters) are compatible with both 4 and 5-wire boards.

## RS-232/485 Terminal Servers

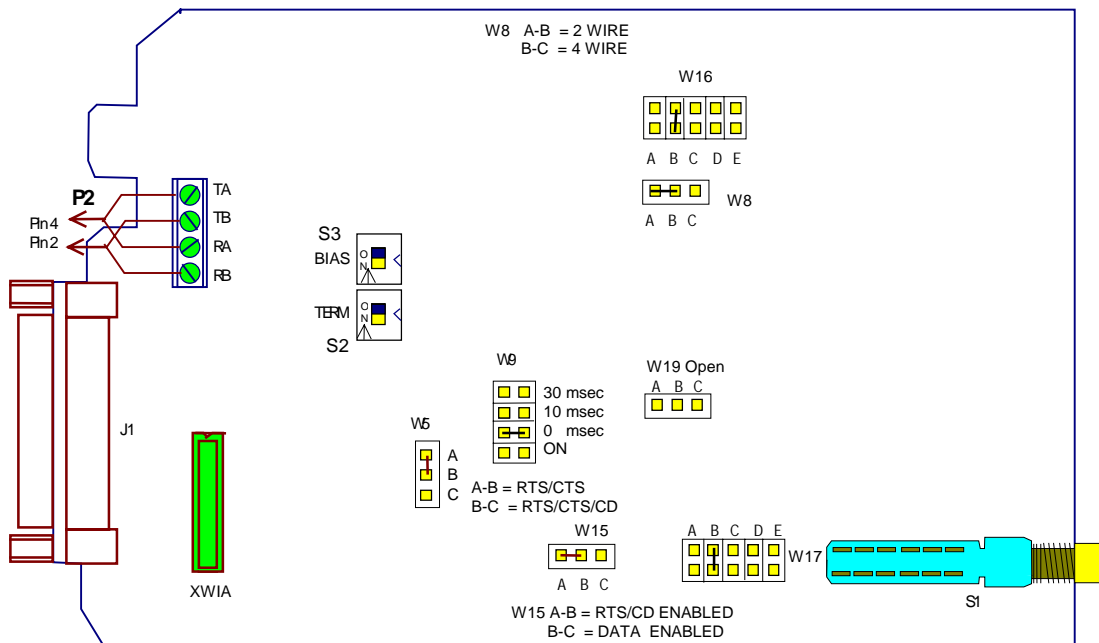
### RS-232 LANtronix® Terminal Server Wiring Diagram



### RS-485 LANtronix® Terminal Server Wiring Diagram



## RS-232-485/422 Converters: Printed Circuit Board Layout



Underlined settings are for LiNC-NET User-Selectable Options  
An asterisk (\*) designates the factory preset jumper settings.

<b>XWIA</b>	<u>DCE*</u>	
<b>XWIB</b>	DTE	
<b>W8</b>	<u>A-B*</u>	<u>4-wire</u>
	B-C	2-wire
<b>W15</b>	<u>A-B*</u>	<u>RTS/CD enabled</u>
	B-C	Data enabled (Maximum speed is 64K)
<b>W5</b>	<u>A-B*</u>	<u>RTS/CTS* delay (normal)</u>
	B-C	RTS/CTS/CD delay (CTS inhibited if CD is present when RTS is raised.)
<b>W9</b>	RTS/CTS delay (The time before the RS-485 driver is enabled and CTS is asserted after RTS is asserted. The RS-485 driver is always enabled.)	
	A	30 msec
	B	10 msec
	<u>C*</u>	<u>0 msec</u>
	D	ON

**W17** When W15 is in the B-C (Data Enabled) position, this is the time the RS-485 driver remains enabled after a low-to-high transition on the DATA line to prevent disabling the driver in the middle of a character.

- A 70 msec
- B\* 7 msec
- C 2 msec
- D 0.7 msec
- E 0.15 msec

**W16** Turnaround delay (When W8 is in the B-C [2 wire] position, this is the time after the driver is disabled and *before* the receiver is enabled.)

- A 0 msec
- B msec
- C\* msec
- D 5 msec
- E 35 msec

**Note:** If the converter is configured Data Enabled (W15, position B-C) and 2-wire (W8, position B-C), then delays from W17 and W16 are cumulative.

**S1** OUT\* Normal

IN Loopback

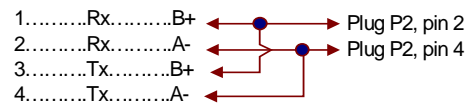
**S2** OFF\* RS-485 Receiver Unterminated

ON RS-485 Terminated

**S3**      OFF\*      Line Bias Off

ON      Line Bias On (The Carrier Detect light will come on. Default is +5 volts.)

**TB1**      4-wire terminal block



**W19**      (Open) - Not jumpered.

## IQ-200 Point Definitions

### Sense Inputs

Point Definitions/Sense				
IQ-200/Designation	LOCATION	8-reader/Designation	LOCATION	4-reader/Designation
S1	P6 Reader A	S20	P3, pin 3, 4	
S2	P9 Reader B	S21	P3, pin 1, 2	
S13	Tamper-P8, pin 1,2	S22	P9, pin 3, 4	
S14	P11, pin 1, 2	S23	P9, pin 1, 2	
S16	P13, pin 3, 4	S24	P5, pin 3, 4	
S17	P13, pin 1, 2	S25	P5, pin 1, 2	
S18	P16, pin 3, 4	S26	P7, pin 3, 4	
S19	P16, pin 1, 2	S27	P7, pin 1, 2	
S36	P7, pin 3, 4	S28	P11, pin 3, 4	S20
S37	P7, pin 1, 2	S29	P11, pin 1, 2	S21
S38	P10, pin 3, 4	S30	P17, pin 3, 4	S22
S39	P10, pin 1, 2	S31	P17, pin 1, 2	S23
		S32	P13, pin 3, 4	S24
		S33	P13, pin 1, 2	S25
		S34	P15, pin 3, 4	S26
		S35	P15, pin 1,2	S27

### Outputs

IQ-200	Connector	Common	Normally Open	Normally Closed	+12VDC Output
IQ-200/Form C relay					
O1	P13	Pin 7	Pin 6	Pin 5	
O2	P16	Pin 7	Pin 6	Pin 5	
IQ-200/Open Collector					
O13	P13	Pin 8			Pin 9
O14	P16	Pin 8			Pin 9
O23	P12	Pin 8			Pin 9
O24	P15	Pin 8			Pin 9

8-reader Expansion PCB	Connector	Common	Normally Open	Normally Closed	+12VDC Output
8-reader PCB/Form C relay					
O3	P3	Pin 7	Pin 6	Pin 5	
O4	P9	Pin 7	Pin 6	Pin 5	
O5	P5	Pin 7	Pin 6	Pin 5	
O6	P7	Pin 7	Pin 6	Pin 5	
O7	P11	Pin 7	Pin 6	Pin 5	
O8	P17	Pin 7	Pin 6	Pin 5	
O9	P13	Pin 7	Pin 6	Pin 5	
O10	P15	Pin 7	Pin 6	Pin 5	
8-reader PCB/Open					
Collector	P3	Pin 8			Pin 9
O15	P9	Pin 8			Pin 9
O16	P5	Pin 8			Pin 9
O17	P7	Pin 8			Pin 9
O18	P11	Pin 8			Pin 9
O19	P17	Pin 8			Pin 9
O20	P13	Pin 8			Pin 9
O21	P15	Pin 8			Pin 9
O22					

4-reader Expansion PCB	Connector	Common	Normally Open	Normally Closed	+12VDC Output
4-reader PCB/Form C relay					
O3	P11	Pin 7	Pin 6	Pin 5	
O4	P17	Pin 7	Pin 6	Pin 5	
O5	P13	Pin 7	Pin 6	Pin 5	
O6	P15	Pin 7	Pin 6	Pin 5	
8-reader PCB/Open Collector					
O15	P11	Pin 8			Pin 9
O16	P17	Pin 8			Pin 9
O17	P13	Pin 8			Pin 9
O18	P15	Pin 8			Pin 9

## **Point Definitions - Sense Inputs**

### **IQ-600 / Cluster Board (P/N 03-10102-10X)**

Cluster PCB is  
used in: IQ-600,  
IQ-600/OUT,  
IQ-600ALM,  
IQ-600/SAM,  
IQ-600/SAM2

S20 P11, pin 3,4 pin 1,3 = Gnd  
S21 P11, pin 1,2  
S22 P17, pin 3,4  
S23 P17, pin 1,2  
S24 P13, pin 3,4  
S25 P13, pin 1,2  
S26 P15, pin 3,4  
S27 P15, pin 1,2

### **IQSAM / 1st SAM Board (P/N 03-10056-003)**

1st SAM PCB is  
used in:  
IQ-200/ SAM,  
IQ-200/SAM2,  
IQ-600/SAM,  
IQ-600/SAM2,  
IQ-1000/SAM,  
IQ-1000/SAM2

S40 P2, pin 1,2 pin 1,3 = Gnd  
S41 P2, pin 3,4  
S42 P3, pin 1,2  
S43 P3, pin 3,4  
S44 P4, pin 1,2  
S45 P4, pin 3,4  
S46 P5, pin 1,2  
S47 P5, pin 3,4

### **IQSAM2/ 2nd SAM Board (P/N 03-10056-003)**

2nd SAM PCB is  
used in:  
IQ-200/SAM2,  
IQ-600/SAM2,  
IQ-1000/SAM2

S48 P2, pin 1,2 pin 1,3 = Gnd  
S49 P2, pin 3,4  
S50 P3, pin 1,2  
S51 P3, pin 3,4  
S52 P4, pin 1,2  
S53 P4, pin 3,4  
S54 P5, pin 1,2  
S55 P5, pin 3,4

### **IQ/OUT/ ALM\***

**S56 P1, pin 7,8 pin 2,4,6,8 = Gnd**

**S57 P1, pin 5,6**

S58 P1, pin 3,4

S59 P1, pin 1,2

S60 P2, pin 7,8

S61 P2, pin 5,6

S62 P2, pin 3,4

S63 P2, pin 1,2

S64 P3, pin 7,8

S65 P3, pin 5,6

S66 P3, pin 3,4

S67 P3, pin 1,2

S68 P4, pin 7,8

S69 P4, pin 5,6

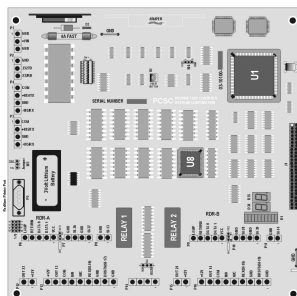
S70 P4, pin 3,4

S71 P4, pin 1,2

\*Sense inputs 56 through 71 are located on the  
ALM PCB (P/N 03-10032-101) in an IQ/ALM.  
The same sense inputs are also used in the  
OUTPUT PCB (P/N 03-10032-004) in an  
IQ/OUT.

Outputs		Form C dry relay contact relay outputs (Contacts are rated at 2 amps @24VDC)				Open Collector
IQ module		Connector	Common	Normally Open	Normally Closed	Trans. Outputs +12V Output @ 100mA max.
<div style="border: 1px solid red; padding: 2px;">           IQ-600 Cluster is used in            IQ-600, IQ-600/OUT,            IQ-600/ALM,            IQ-600/SAM,            IQ-600/SAM2         </div>	O3	P11	pin 7	pin 6	pin 5	
	O4	P17	pin 7	pin 6	pin 5	
	O5	P13	pin 7	pin 6	pin 5	
	O6	P15	pin 7	pin 6	pin 5	
	O15	P11	pin 8			pin 9
	O16	P17	pin 8			pin 9
	O17	P13	pin 8			pin 9
	O18	P15	pin 8			pin 9
<u>IQ/OUT/Output Adapter</u>						
	O25		P5, P9 pin 8	P9 pin 7	P5 pin 7	
	O26		P5, P9 pin 6	P9 pin 5	P5 pin 5	
	O27		P5, P9 pin 4	P9 pin 3	P5 pin 3	
	O28		P5, P9 pin 2	P9 pin 1	P5 pin 1	
	O29		P6, P10 pin 8	P10 pin 7	P6 pin 7	
	O30		P6, P10 pin 6	P10 pin 5	P6 pin 5	
	O31		P6, P10 pin 4	P10 pin 3	P6 pin 3	
	O32		P6, P10 pin 2	P10 pin 1	P6 pin 1	
	O33		P7, P11 pin 8	P11 pin 7	P7 pin 7	
	O34		P7, P11 pin 6	P11 pin 5	P7 pin 5	
	O35		P7, P11 pin 4	P11 pin 3	P7 pin 3	
	O36		P7, P11 pin 2	P11 pin 1	P7 pin 1	
	O37		P8, P12 pin 8	P12 pin 7	P8 pin 7	
	O38		P8, P12 pin 6	P12 pin 6	P8 pin 5	
	O39		P8, P12 pin 4	P12 pin 3	P8 pin 3	
	O40		P8, P12 pin 2	P12 pin 1	P8 pin 1	

# Appendix-IQ-200 Specifications



## **IQ-200 Features**

**2 Auxiliary Powered Outputs (cc# 23, 24)**

**1 Supervised Tamper Sense Input (S13)**

**2 Reader Ports:** -5-wire Wiegand interface

-4-wire PCSC Proprietary

**2 Form C Door Strike Outputs (2 Amps @ 24 VDC)**

(cc# 1 and 2) 2 Amps continuous power @12/24 VDC

**2 Door Left Open Outputs (or 2 External Shunt Options) (cc# 13 and 14)**

**2 Supervised Door Senses (S17, 19)**

**5 User Defined Sense Inputs (S14, 36, 37, 38, 39)**

**2 Request to Exit Inputs (S16, 18)**

**Battery Backed Clock Calendar**

**Flash RAM 128K standard (up to 256K)**

**Battery Backed RAM 256K standard (up to 512K)**

**LEDs for:** Power, alarm, on-line diagnostics  
Reader Data [Error code, door status]  
Tamper detect (S13)

## **System Capacities**

**Cardholder Capacity:** 8,000 (20,000 w/Memory Expansion)

**Time Periods:** 32

**Holiday Time Periods:** 32

**Holiday List:** 365 Days

**History Transactions:** 4,000 regardless of memory size

## **Spare Parts- IQ-200 PCB**

<b>Part Number</b>	<b>Description</b>	<b>Designation</b>
81-09005	3V Lithium Battery (no pins)	BT1
78-01001	4A 250V 1/4 x 1/4, 3AG Fuse	F1
83-02082	5-pin Plug Connector	P6, P9
83-02083	2-pin Plug Connector	P8, P11, P12, P15
83-02084	4-pin Plug Connector	P3, P4, P7, P10, P14
83-02085	3-pin Plug Connector	P1, P2
83-02086	9-pin Plug Connector	P13, P16
79-03022	DPST Relay	K1, K2
83-02007	Jump Connector	For W1 - W5

## IQ 4-Reader Expansion Module-

The IQ-200 2-reader system can be expanded to a 6-reader system by installing the 4-reader Expansion Module. The circuit board (Part # 03-10102-10X) can be mounted below the circuit board in the larger enclosures available from PCSC. Once mounted, the circuit board is connected to the IQ-200 by installing a 50-pin ribbon expansion cable from P1 on the 4-reader module to J1 on the IQ-200.

The 4-reader Expansion module allows the user to connect up to 4 additional readers to the IQ-200. Each of the reader interfaces support either a PCSC proprietary reader (4-wire interface), or a Wiegand reader (5-wire interface). The Expansion Module also provides an additional 4 interfaces for each of the readers and the associated doors. These include the following:

- Multilevel door sense inputs (Supervised door sense inputs)
- Reader Present inputs (Reader connected/disconnected)
- Request to Exit inputs (Unsupervised egress inputs)
- Relay contacts for door control outputs (Form C dry contacts rated for 2.5 Amps @ 12/24VDC continuous power)
- Door shunt outputs (Open Collector output rate for +12 VDC @ 100mA)
- Door Shunt/Local Alarm

## Power Supply

The 4-reader Expansion Module requires +5VDC for all logic. Relays, output drivers, etc. require a +12VDC supply. The +5VDC and +12VDC is provided to the module via the 50-pin expansion cable, which connects plug P1 of the 4-door cluster PCB (P/N 03-10102-10X) to plug J1 of the IQ-200 board, (P/N 03-10100-201).

## Door Sense LEDs

4 LEDs located at D21, D22, D23, and D24 indicate the status of the Door circuits. Resistors must be installed at the door contacts, the switches in place, door closed (normal state), and the lines calibrated, in order for the supervised inputs to function. See Step 4 for installation and calibration procedure.

### LED Status Chart:

- Sense Input #21 LED is D21
- Sense Input #23 LED is D22
- Sense Input #25 LED is D23
- Sense Input #27 LED is D24

<b>NOTE</b>	LEDs D17-D20 are not used in the IQ-600
-------------	---

<b>OFF</b>	Circuit is in normal/secure state
<b>ON</b>	Circuit is in an alarm condition state
<b>0.5 MHz blink</b>	Fault condition. Open circuit state
<b>1 Hz blink</b>	Fault condition. Short circuit state
<b>4 Hz blink</b>	Circuit is NOT calibrated & NOT in a functional state

## **IQ-600 Features (IQ-200 plus 4-Reader Expansion Module)**

**2 Auxiliary (Powered) Outputs (cc# 23, 24)**

**6 Reader Ports:** (Wiegand electrical interface for PCSC and OEM card readers) (Readers **a-f**)

**6 Form C Door Strike Outputs** (2.5 amps @ 12/24 VDC continuous power)

**6 Door Left Open Outputs** (or 10 External Shunt Options)

**6 Supervised Door Senses** (17, 19, 21, 23, 25, 27)

**5 Supervised User-Defined (Auxiliary) Sense Inputs (14, 36, 37, 38, 39)**

**2 Supervised Request to Exit Inputs (16, 18)**

**4 Unsupervised Request to Exit Inputs (20, 22, 24, 26)**

**Battery Backed Clock Calendar**

**Flash RAM 128K standard (up to 256K)**

**Battery-Backed RAM 256K standard (up to 512K)**

**LEDs for:** Power, alarm, on-line diagnostics Reader Data [Error code, door status]

**Supervised Tamper detect (S13)**

### **System Capacities**

**Cardholder Capacity:** 8,000 (20,000 w/ Memory Expansion)

**Time Periods:** 32

**Holiday Time Periods:** 32

**Holiday List:** 365 Days

**History Transactions:** 4,000 regardless of memory size

**Enclosure Dimensions:** 18"H x 11.5"W x 6"D (45.7cm x 29.2cm x 15.2cm)

**Weight:** 38 lbs. (17.3kg)

**Power:** 12VDC

**Draw:** 3 amp @ 12VDC

**Temperature:** 32°F to 115°F (0°C to 46°C)

**Communications:** RS485 standard  
RS232 standard  
Dial-up standard  
Ethernet optional

### **Spare Parts- IQ-600 PCB**

<b>Part Number</b>	<b>Description</b>	<b>Designation</b>
83-02082	5-pin Plug Connector	P10, P12, P14, P16
83-02086	9-pin Plug Connector	P11, P13, P15, P17
79-03022	DPST Relay	K5- K8
83-2007	Jump Connector	W1-W3, W5-W6, W11-W14

## **IQ 8-Reader Expansion Module-**

The IQ-200 2-reader system can be expanded to a 10-reader system by installing the 8-reader Expansion Module. The circuit board can be mounted below the circuit board in the larger enclosures available from PCSC. Once mounted, the circuit board is connected to the IQ-200 by installing a 50-pin ribbon expansion cable from P1 on the 8-reader module to J1 on the IQ-200. The 8-reader Expansion module allows the user to connect up to 8 additional readers to the IQ-200. Each of the reader interfaces support either a PCSC proprietary reader (4-wire interface), or a Wiegand reader (5-wire interface). The Expansion Module also provides 8 additional interfaces for each of the readers and the associated doors. These include the following:

- Multilevel door sense inputs (Supervised door sense inputs)
- Reader Present inputs (Reader connected/disconnected)
- Request to Exit inputs (Unsupervised egress inputs)
- Relay contacts for door control outputs (Form C dry contacts rated for 2.5 Amps @ 12/24VDC continuous power)
- Door shunt outputs (Open Collector output rated for +12 VDC @ 100mA)
- Door Shunt/Local Alarm

### **Power Supply**

The 8-reader Expansion Module requires +5VDC for all logic. Relays, output drivers, etc. require a +12VDC supply. The +5VDC and +12VDC is provided to the module via the 50-pin expansion cable, which connects plug P1 of the 8-door cluster PCB (P/N 03-10102-001) to plug J1 of the IQ-200 board, (P/N 03-10100-201).

### **Door Sense LEDs**

8 LEDs located at D17, D18, D19, D20, D21, D22, D23, and D24 indicate the status of the Door circuits. Resistors must be installed at the door contacts, the switches in place, door closed (normal state), and the lines calibrated, in order for the supervised inputs to function. See Step 6 for installation and calibration procedure.

#### **LED Status Chart:**

- Sense Input #21 LED is D17
- Sense Input #23 LED is D18
- Sense Input #25 LED is D19
- Sense Input #27 LED is D20
- Sense Input #29 LED is D21
- Sense Input #31 LED is D22
- Sense Input #33 LED is D23
- Sense Input #35 LED is D24

**OFF**

**ON**

**0.5 MHz blink**

**1 Hz blink**

**4 Hz blink**

Circuit is in normal/secure state

Circuit is in an alarm condition state

Fault condition. Open circuit state

Fault condition. Short circuit state

Circuit is NOT calibrated & NOT in a functional state

## **IQ-1000 Features (IQ-200 plus 8-reader Expansion Module)**

### **2 Auxiliary (Powered) Outputs (cc# 23, 24)**

**10 Reader Ports:** (Wiegand electrical interface for PCSC and OEM card readers) (readers a-j)

**10 Form C Door Strike Outputs** (2.5 amps @ 12/24 VDC continuous power)

**10 Door Left Open Outputs** (or 10 External Shunt Options)

**10 Supervised Door Senses** (17, 19, 21, 23, 25, 27, 29, 31, 33, 35)

**5 Supervised User-Defined (Auxillary) Sense Inputs (14, 36, 37, 38, 39)**

**2 Supervised Request to Exit Inputs (16, 18)**

**8 Unsupervised Request to Exit Inputs (20, 22, 24, 26, 28, 30, 32, 34)**

**Battery Backed Clock Calendar**

**Flash RAM 128K standard (up to 256K)**

**Battery-Backed RAM 256K standard (up to 512K)**

**LEDs for:** Power, alarm, on-line diagnostics Reader Data [Error code, door status]

**Supervised Tamper detect (S13)**

### **System Capacities**

**Cardholder Capacity:** 8,000 (20,000 w/ Memory Expansion)

**Time Periods:** 32

**Holiday Time Periods:** 32

**Holiday List:** 365 Days

**History Transactions:** 4,000 regardless of memory size

**Enclosure Dimensions:** 18"H x 11.5"W x 6"D (45.7cm x 29.2cm x 15.2cm)

**Weight:** 38 lbs. (17.3kg)

**Power:** 12VDC

**Draw:** 3 amp @ 12VDC

**Temperature:** 32°F to 115°F (0°C to 46°C)

**Communications:** RS485 standard

RS232 standard

Dial-up standard

Ethernet optional

### **Spare Parts- IQ-800 PCB**

<b>Part Number</b>	<b>Description</b>	<b>Designation</b>
83-02082	5-pin Plug Connector	P2, P4, P6, P8, P10, P12, P14, P16
83-02086	9-pin Plug Connector	P3, P5, P7, P9, P11, P13, P15, P17
79-03022	DPST Relay	K1- K
83-2007	Jump Connector	W1-W14

## Cable Requirements and Maximum Lengths

### Communication-

Type of Technology	Models	Type of 22awg Stranded Wire	Maximum Distance	Max. Distance w/PIN Pad (BP-250)
IQ-200		2-pair, twisted, w/ overall shield	To the last IQ-200 (4,000 ft (1,219 m))	

### 4-wire Wiegand-

Type of Technology	Models	Type of 22awg Stranded Wire	Maximum Distance	Max. Distance w/PIN Pad (BP-250)
ProTech	BR-350	2-pair, twisted, w/ overall shield	2000 ft. (192 m)	2000 ft. (192 m)
Magnetic Stripe	BR-450	2-pair, twisted, w/ overall shield	2000 ft. (192 m)	2000 ft. (192 m)

### 5-wire Wiegand-

Type of Technology	Models	Type of 22awg Stranded Wire	Maximum Distance	Max. Distance w/PIN Pad (BP-270)
ProTech	BR-370	3-pair, twisted, w/ overall shield	500 ft. (192 m)	500 ft. (192 m)
Magnetic Stripe	BR-470	3-pair, twisted, w/ overall shield	500 ft. (192 m)	500 ft. (192 m)
Proximity	All models	3-pair, twisted, w/ overall shield	500 ft. (192 m)	500 ft. (192 m)
Biometric	All models	3-pair, twisted, w/ overall shield	500 ft. (192 m)	500 ft. (192 m)
Bar Code	All models	3-pair, twisted, w/ overall shield	500 ft. (192 m)	500 ft. (192 m)
Vehicle ID	VR-670	3-pair, twisted, w/ overall shield	500 ft. (192 m)	500 ft. (192 m)

2-pair twisted and shielded cable recommended brands are:

**Belden 8728    Olympic 3030    Alpha 2404 or 2212**

3-pair twisted and shielded cable recommended brands are:

**Belden 8777    Alpha 6010C    WPW D431**

**NOTE** All data communications cables must reside in a separate electrical conduit. Absolutely **NO** high voltage or AC power cables allowed within data conduits.

## **Tool Requirements-**

### **Cable Connection tool**

Inserting the cable to the AMP connectors from the PCSC readers must be performed with either an AMP Insertion Handle (P/N 88-08003) w/ an AMP Head (P/N 88-08005) or an AMP hand tool (P/N 88-08006) for MTA connectors. Any other tool may cause improper connection or damage to the system. On the IQ-200 circuit board, a standard screwdriver is required for securing cabling connections.

### **Reader Locking tool**

As a security measure, some readers are equipped with a security bolt. This bolt requires a special driver (P/N 88-08002) to secure each reader and PIN pad.

## **Controller Specifications**

### **Microprocessor**

The IQ-200 Controller is based on a 80C188EB microprocessor, operating at 16 MHz. The 80C188EB is a 16-bit processor (internal operation) with an eight-bit data bus. A 20-bit address bus provides a 1M Byte addressing range. Other features include three internal 16-bit timers, interrupt controller (8529 equivalent), multiple programmable chip select decoders with programmable wait states, and two serial communication channels.

### **LEDs and DIPSwitches**

Ten discrete LEDs are provided which the microprocessor software can individually control. Eight general-purpose switches are provided for use by the microprocessor software, and are utilized for mode control, configuration setting, ID selection, etc. In addition, a Power ON LED and two "Reader Active" LEDs are provided.

### **Two Seven-Segment LED Display**

Error codes are displayed in Hexadecimal format. Refer to the error code section for listing of codes and their meanings.

### **Real Time Clock**

A real time clock (DS1302) with battery backup is provided for time of day information.

### **Serial Communication-**

Two serial communication ports are provided by the IQ-200 controller.

- RS-485: Four wire (twisted pair) interface which is optically isolated from the controller.  
-Provision for installing a termination resistor is provided.
- RS-232: At P5 (RS232 DB9 – MODEM). At P2 (RS232 Direct Connect) – standard RS232 interface. A DB9 connector with AT pinout is provided for an industry standard RS-232 interface.

## **Power Supply**

The IQ-200 controller requires +5VDC *for all logic*. Relays, output drivers, etc. require a +12VDC supply. An on-board dc-dc converter accepts an external voltage source of 10-26VDC, and converts this unregulated source to the required +5VDC. For an input voltage range of 10-15 volts, the “+12VDC” converts this voltage source to the required +12VDC.

## **Battery Back-up Requirements**

A 12 AH battery is recommended as a back-up to the power supply, because it is the largest battery that will fit in the enclosure. The battery should be connected to the power supply charger in accordance with the manufacturer's instructions.

## **Factory Settings**

At the factory the IQ is set as IQ #1, communications as direct connect (RS232/RS485) @ 9600 baud, with 120 Ohm resistor termination disabled (W5 jumper set at 1-2).

## 4-Reader Expansion Board- Active LEDs

4 LEDs located at D61, D62, D67, D68 indicate the status of the Reader circuits. When the LED blinks momentarily after a card swipe, the system is processing the card data. The LED is normally off.

### Reader LED Status:

- Reader C LED is D61
- Reader D LED is D62
- Reader E LED is D67
- Reader F LED is D68

## Jumpers

Reader type is selected by the use of jumpers located in between the reader ports at W5 and W11-W14. Refer to each diagram of reader-types on **Step 3** for the proper setting of these jumpers. Four other jumpers, located at W1, W2, W3, and W6, designate chip selection, and are set at the factory. They should not be changed unless directed by technical support.

The setting of the four jumpers at W5 (**4W** or **5W**) determines how the jumpers next to each reader port is set. Also, when using a 5-wire, 12VDC reader, you can control the voltage at PIN 1, by moving the leftmost jumpers at W5 in conjunction with the reader port jumper setting (see below).

## 4-Reader Expansion Board- Jumper Selections

There are 5 jumper units located on the 4-Reader expansion PCB circuit board. The settings are shown below.

- W1 at Pins 1 and 2 = PCB addressed to 30h
- W1 at Pins 3 and 4 = PCB addressed to 50h
- W2 and W3 at pins 1 and 2 = A/D is max 158 type
- W2 and W3 at pins 2 and 3 = A/D is max 7828 type
- W4 NOT USED ON 4-READER EXPANSION PCB

### PIN Designation Chart

10	7	4	1
11	8	5	2
12	9	6	3

← **W5**

- W5 (for Readers **c-f**)
  - At pins 1 and 2, 4 and 5, 7 and 8, 10 and 11= Wiegand 5-Wire 5 volt card readers
  - At pins 1 and 2, 4 and 5, 7 and 8, 11 and 12= Wiegand 5-Wire 12 volt card readers
  - At pins 2 and 3, 5 and 6, 8 and 9, 11 and 12= PCSC 4-Wire 12 volt card readers
- W6 – Reader T/O
  - At pins 1 and 2 = 32 ms (PCSC Factory Set. Do not modify)
  - At pins 2 and 3 = 64 ms
- W11-W14 Reader Data Format
  - At pins 1 and 2 = Wiegand 5-wire (Data 1's and Data 0's) format
  - At pins 2 and 3= PCSC 4-wire (proprietary) format
- SW1 Switch Settings (to configure PCB for doors 3-6)
  - Switches 1, 3-8 = ON as labeled on DIP Switch Pack
  - Switch 2 = OFF

## 8-Reader Expansion Board- Active LEDs

8 LEDs located at D49, D50, D55, D56, D61, D62, D67, D68 indicate the status of the Reader circuits. When the LED blinks momentarily after a card swipe, the system is processing the card data. The LED is normally off.

### Reader LED Status:

- Reader C LED is D49
- Reader D LED is D50
- Reader E LED is D55
- Reader F LED is D56
- Reader G LED is D61
- Reader H LED is D62
- Reader I LED is D67
- Reader J LED is D68

## Jumpers

Reader type is selected by the use of jumpers located in between the reader ports at W4-W5 and W7-W14. Refer to each diagram of reader-types on **pages 30-48** for the proper setting of these jumpers. Four other jumpers, located at W1, W2, W3, and W6, designate chip selection, and are set at the factory. They should not be changed unless directed by technical support.

The setting of the jumpers at W4 and W5 (**4W** or **5W**) determines how the jumpers next to each reader port is set. Also, when using a 5-wire, 12VDC reader, you can control the voltage at PIN 1, by moving the #3 jumpers at W4 and W5 in conjunction with the reader port jumper setting.

## 8-Reader Expansion Board- Jumper Selections

There are 5 jumper units located on the 8-Reader expansion PCB circuit board. The settings are shown below.

- W1 at Pins 1 and 2 = PCB addressed to 30h
- W1 at Pins 3 and 4 = PCB addressed to 50h
- W2 and W3 at pins 1 and 2 = A/D is max 158 type
- W2 and W3 at pins 2 and 3 = A/D is max 7828 type

### PIN Designation Chart

10	7	4	1
11	8	5	2
12	9	6	3

**W4**  
← and  
**W5**

- W4 (for Readers **c-f**)
  - At pins 1 and 2, 4 and 5, 7 and 8, 10 and 11= Wiegand 5-Wire 5 volt card readers
  - At pins 1 and 2, 4 and 5, 7 and 8, 11 and 12= Wiegand 5-Wire 12 volt card readers
  - At pins 2 and 3, 5 and 6, 8 and 9, 11 and 12= PCSC 4-Wire 12 volt card readers
- W5 (for Readers **g-j**)
  - At pins 1 and 2, 4 and 5, 7 and 8, 10 and 11= Wiegand 5-Wire 5 volt card readers
  - At pins 1 and 2, 4 and 5, 7 and 8, 11 and 12= Wiegand 5-Wire 12 volt card readers
  - At pins 2 and 3, 5 and 6, 8 and 9, 11 and 12= PCSC 4-Wire 12 volt card readers
- W6 – Reader T/O
  - At pins 1 and 2 = 32 ms (PCSC Factory Set. Do not modify)
  - At pins 2 and 3 = 64 ms
- W11-W14 Reader Data Format
  - At pins 1 and 2 = Wiegand 5-wire (Data 1's and Data 0's) format
  - At pins 2 and 3= PCSC 4-wire (proprietary) format
- SW1 Switch Settings (to configure PCB for doors 3-6)
  - Switches 1, 3-8 = ON as labeled on DIP Switch Pack
  - Switch 2 = OFF

**End of Manual**  
**PCSC, Inc.**  
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